A LONGITUDINAL AND COMPARATIVE STUDY OF MERGER AND ACQUISITION PATTERNS OF CABLE SYSTEMS AND TELEPHONE COMPANIES IN THE MULTIMEDIA CONTEXT 1984-1999

By

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Abstract of Dissertation Presented to the Graduate School
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A LONGITUDINAL AND COMPARATIVE STUDY OF MERGER AND ACQUISITION PATTERNS OF CABLE SYSTEMS AND TELEPHONE COMPANIES IN THE MULTIMEDIA CONTEXT 1984-1999

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The merger and acquisition activity in the telecommunications industries reached a historical high level in the 1990s. At the same time, the number of cross-industry combinations—for example, a telephone company with a cable TV system, a television network with a major cable network, and an Internet service provider with a cable network—also increased rapidly. This phenomenon has driven people's attention to the issue of media convergence and the conjecture of an emerging multimedia industry.

To gain a better understanding of this merger wave, we investigated the merger/acquisition patterns of telephone and cable industries from 1984 through 1999 in the context of multimedia industry. Telephone and cable industries were selected as the major focus mainly because they are currently the most likely major players in light of current development of telecommunications technologies (i.e., xDSLand cable modem) and the ownership of nationwide networks for information delivery.

The present study used census data. All the merges and acquisitions completed by the telephone and cable industries from 1984 through 1999 were collected for analysis. In addition to the changes in the regulatory and technological environment, three merger/acquisition models—product/market-portfolio model, strategy model, and sequential model—were adopted to examine factors that affected the diversification patterns. We found that companies with slower revenue growth were more likely to pursue diversification and international expansion. Companies were more likely to pursue diversification and internationalization in the 1990s than in the 1980s.

Furthermore, supportive of the strategy model, companies were more likely to acquire target firms that were technologically or vertically related to the acquirers' core business. Mergers were also more likely to occur when the two firms served the same type of customers. The findings also support the sequential model of merger activity. Prior diversification patterns had a considerable positive impact on subsequent patterns. The product/market-portfolio model, which focuses on the growth and profitability of the target markets, was not supported.

We also found that, in general, cable systems tended to focus on mergers and acquisitions that were intended to strengthen competitive position in the traditional market. For example, they were more likely to merge with or acquire television stations (i.e., broadcasting) and firms in the audio-visual sector (e.g., video production and distribution). By contrast, telephone companies were more interested in entering the multimedia market and in providing integrated services.

CHAPTER 1
INTRODUCTION

A quick review of the development in the media and telecommunications industries[1] in recent years reveals a dazzling wave of business combinations. Based on data compiled by the trade journal Mergers and Acquisitions, the magnitude of mergers in the telephone industry started to increase dramatically from 1994. In 1993 the transaction value totaled only about $9.5 billion; the trading level surged by more than 200% to nearly $30 billion in 1994. The trading momentum continued to increase rapidly each year thereafter. In 1998, the total transaction value reached an astronomical level of more than $98 billion.

Trading in the broadcasting sector also exhibited a dramatic increase around the same time. In 1993 total amount of capital invested into purchases of media firms was only $2.2 billion. The trading level surged rapidly by nearly 440% to $11.7 billion, and reached a historical high level of more than $61 billion in 1996.

One recent transaction that has attracted people's attention was Walt Disney's purchase in 1995 of Capital Cities/ABC and its ten TV stations, 21 radio stations, and interest in several cable networks for $19 billion (Albarran & Dimmick, 1996). Another high-profile transaction was the $10.8 billion merger between US West and Continental

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[1] For the purposes of this study, telecommunications are referred to as conventional telephony industry, and media are referred to as mass media, especially the electronic media such as broadcasting and cable television. For the sake of parsimony, the term telecommunications is used later in the study to represent both telephony and media industries.

Cablevision in 1996. This one ushered in the combination of telephone and cable industries after passage of the Telecommunications Act of 1996 (Tseng & Litman, 1998).

Even more stunning in scale and scope is AT&T's successive purchases of Tele-Communication Inc. (TCI) and MediaOne in just two years (1998-1999). The deals with these two cable companies would give AT&T immediate access to at least 25% of all U.S. cable households. In January 2000, AOL announced its plan to buy Time Warner—the second largest multiple system operator (MSO) in the United States—for $156 billion. It is believed that this merger will trigger and facilitate a wave of combinations of conventional media and the Internet. During the same period, a series of large-scale mergers and acquisitions occurred among common carriers. For example, Bell Atlantic purchased NYNEX for more than $21 billion in 1997. WorldCom acquired MCI for $42 billion in 1998.

Mergers in the Multimedia Context

In addition to the record-breaking transaction values of numerous high-profile merger/acquisition deals, another interesting phenomenon of the merger trend in the 1990s was the increasing number of cross-industry combinations—for example, a telephone company combining with an MSO, a television network merging with a major cable network, and an Internet service provider acquiring an MSO. This phenomenon drove attention to the strategic role of business combination in realizing the potential of providing integrated services over a single transmission network in telecommunications; in addition, it supported the conjecture regarding convergence within an emerging multimedia industry (Griffith & Taylor, 1996; Wasserstein, 2000).

Indeed, the idea of integrated services for communications networks had long been discussed and promoted but seldom truly realized in actual systems in the past. However, as telecommunications industries in the U.S. were increasingly deregulated and telecommunications and digital technologies continue to develop rapidly, the concept of "multimedia"—one-stop shopping for video, data, and voice services via a single integrated transmission network—has been increasingly put into practice in the telecommunications sector in the 1990s (Baldwin, McVoy, & Steinfield, 1996; Dodds, 1995; Egan, 1996; Owen, 1999).

As telecommunications technologies and services increasingly converge, the former clear-cut classification of information content and its corresponding delivery vehicle in the telecommunications industry has increasingly blurred. The phenomenon of unclear boundaries among information service, computer, media, and telecommunications markets is best reflected in the various terminologies used to define this all-encompassing aspect of technological convergence. Some earlier studies use "multimedia" to describe the one-stop shopping of information services (Colombo & Garrone, 1998; Dodds, 1995; Egan, 1996; Griffith & Taylor, 1996). Some others used "information" (Shapiro & Varian, 1999), "full service networks" (Baldwin, McVoy, & Steinfield, 1996), or "infocome" (Chakravarthy & Rodan, 1999) to denote the similar, if not the same, concept. The variation often depended on how the authors defined the scope of this emerging industry.

An important implication of the sophisticated structure and ambiguous boundary of multimedia industry is that a single firm cannot hope to offer all the pieces of integrated services by itself, at least not in the short run. To achieve system integration, businesses selling complementary components—that is, complementors or collaborators—have taken on a critical role in the multimedia economy (Shapiro & Varian, 1999). As such, mergers, joint ventures, and strategic alliances are very often regarded as efficient business strategies through which to enter the multimedia market quickly (Chan-Olmsted & Jamison, 2000; Jamison, 1999).

The prospect that the current merger wave in the telecommunications industries is associated with the intention to enter the emerging multimedia industry (Chan-Olmsted, 1998; Colombo & Garrone, 1998), thus, gives rise to several questions. To what extent did the merger wave in the 1990s reflect the multimedia trend? How did the merger wave in the 1990s differ from that in the 1980s? Which industries were the major players in the multimedia-related mergers? What strategies did the acquiring firms adopt to cope with or take advantage of the changing landscape? What were the factors that set off the market convergence and in what direction?

Scope of Multimedia Industry

Before we can answer these questions, it is necessary to have a better understanding of what the multimedia industry is about. However, partly because of the evolving nature of technological convergence and partly because of the fact that the market of integrated multimedia services is still in its infant stage (Federal Communications Commission, 2000a, 2000b), it is virtually impossible to draw definitive market boundaries for the industry. To cope with this difficulty, this study draws on some basic characteristics mentioned in previous literature on the multimedia industry to provide an outline of the industry. In order to avoid confusion, the present study uses the term "multimedia" to denote the integration of different communications technologies and services. Different terms are used only in accordance with the literature cited.

Broadly defined, multimedia industry consists of two most essential segments: technological convergence and information convergence (Baldwin, McVoy, & Steinfield, 1996). Components such as availability of network infrastructure, bandwidth, high-speed transmission, and terminal equipment constitute the technological aspect. On the other hand, information content such as video programming, voice telephony, and other information products, and information services such as data processing and packaging are the basic components of the information convergence.

Broadband Infrastructure Deployment

According to Shapiro and Varian (1999), the information industry is characterized by the complementary and interdependent relationship between content (information products) and infrastructure (distribution channels). Neither the information nor the distribution is of much value without the other. According to Economides (1996), the information industry is a type of network economy. It is inherent in the structure of a network that many components of a network are required for the provision of a typical service. Services demanded by customers are composed of many complementary components.

Werbach (1997) noted that broadband infrastructure, with high transmission speed and bandwidth capacity, is an inseparable element in the provision of multimedia services because it represents, among other things, the heart of technological convergence in breaking down the barriers between different services and networks. According to the definition adopted by the FCC (2000b), broadband is the capacity of supporting at least

200 kilobits/second in the consumer's connection to the network (i.e., the so-called "last mile"), both from the provider to the consumer (downstream) and from the consumer to the provider (upstream). However, there are also variations of broadband services that offer higher speed and capacity than conventional dial-up modems, though they do not necessarily meet the FCC's definition.

Two major broadband pipelines: cable and telephone

Although broadband services can be delivered either through wireline or wireless transmission, wireline is currently preferred as the major broadband pipeline. As far as wireline broadband deployment is concerned, cable modem and xDSL technology are the two major players (Table 1-1). In terms of high-speed services, cable modem recently accounted for 84%; xDSL accounts for 11%, with others accounting for only 5% (FCC, 2000a). However, a new industry report noted that the difference between cable modem users and DSL subscribers had increasingly narrowed (DSL gaining on cable in high-speed race, 2001, March 15). As of January 2001, cable model accounted for 51% of the high-speed service market; DSL accounted for 39%.

Both cable systems and telephone companies have established extensive infrastructure nationwide. Therefore, they are currently the most appropriate for residential broadband-services providers. According to the estimates of Kagan Media Appraisals (2000), by the end of 2000, as much as 75% of U.S. cable networks will be upgraded for two-way transmission with bandwidth of 750 MHz. This means that nearly 51 million U.S. cable households will be able to purchase access to two-way services (i.e., via cable modem), such as high-speed data transmission, telephony, and interactive TV. Based on an earlier FCC (1999a) staff report, the projections for residential cable modem subscribers would reach the range from four to six million by 2002, and more than eleven million by 2005.

Table 1-1. Comparison of cable modem and DSL technologies.

Category	Cable industry (cable modem)	Telephony industry (digital subscriber line-DSL)
High-speed infrastructure development	--Typical infrastructure upgrade incorporates a hybrid fiber-coaxial (HFC) distribution plant, using high-capacity optical fiber to connect headends and nodes in combination with traditional coaxial cable to connect nodes and end-user homes. --Cable operators typically increase transmission capacity to 550 MHz or 750 MHz for two-way high-speed services. --Many cable systems offer asymmetric two-way service, with the great majority of available bandwidth for downstream transmissions and limited remaining bandwidth for upstream transmissions.	--With the addition of certain electronics to the telephone line, carriers can transform the copper loop that already provides voice service into a conduit for high-speed data traffic. --With DSL technologies, a high-speed signal is sent from the end-user's terminal through the last 100 feet and the last mile of copper loop unit it reaches the carrier's central office. --With asymmetric DSL (ADSL) offering, downstream speed can reach 200 Kbps, but slower upstream speed. With symmetric DSL (SDSL), both upstream and downstream speeds can reach 200 Kbps.
Technical characteristics	--Under optimal conditions, cable modem can provide maximum downstream speed of 27 Mbps and maximum upstream speed of 10 Mbps. --In practice, cable transmission speeds typically range from several hundred kilobits per second to 1.5 Mbps because of the limitations of shared (tree-like) network infrastructure and depending on the number of users at one time.	--DSL technologies are distance sensitive. An ADSL customer must be within approximately 18,000 feet of the central office. SDSL must be between 10,000 and 12,000 feet of the central office. --Devices used to improve quality of voice transmission prevent the deployment of DSL services. --In addition to DSL, many carriers offer traditional high-speed, circuit switched services like T1 lines.
Potential high-speed access service markets	--Broadband access service is available primarily to residential customers because the traditional market of cable systems is video programming services, and because the technical limitations cannot guarantee consistent high-speed services for business customers.	--Many carriers use fiber technology to deliver signals at speed in excess of 45 Mbps directly to certain large business customers. --Residential and smaller business customers mostly subscribe to less costly DSL services. --Due to high cost of deployment, fiber-based residential architectures are available only in most densely populated residential settings.
Integrated services	--The tree-like network infrastructure is most eligible for combining video and high-speed access services.	--The star-like network infrastructure is most eligible for combining voice and high-speed access services.

Table 1-1—continued.

Category	Cable industry (cable modem)	Telephony industry (digital subscriber line-DSL)
High-speed service market share	--Accounted for 65% of 3.5 million broadband users as of April/2000. --Accounted for 51% of 5.1 million broadband users as of January/2001.	--Accounted for 24% of 3.5 million broadband users as of April/2000. --Accounted for 39% of 5.1 million broadband users as of January/2001.
High-speed technology availability	--Cable model service was available to 52% (50.3 million) of 96.6 million homes passed by cable in U.S. as of 1999 end. --By 2004, cable modem service will be available to 84% of all U.S. households.	--DSL deployment was available to 27% of U.S. households as of 1999 end. --DSL deployment will have the potential to reach 80% of U.S. households by 2004.

Note: Data were compiled from following sources: DSL gaining on cable in high-speed race (2001, March 15); FCC (2000a)

Spurred by the deployment of cable modem by major multiple system operators (MSOs), incumbent local exchange carriers (ILECs) and competitive local exchange carriers (CLECs) also adopted aggressive plans of broadband network deployment (i.e., xDSL). However, compared to cable modem, DSL deployment currently has a considerable lag in terms of penetration rate and total number of residential subscribers. Although the incumbent exchange carriers have possessed DSL technology since the late 1980s, they did not offer the services for concerns that this would have an adverse impact on the T1 business, which is a form of high-speed access sold primarily to business customers (FCC, 1999a).[2] As a consequence of aggressive deployment planning by telephone companies, the FCC (2000a) estimated that cable modem deployment was available to 52% (50.3 million) of 96.6 million homes passed by cable in U.S. by the end of 1999; DSL deployment was available to only 27% of U.S. households. By 2004, cable modem service will be available to 84% of U.S. households, and DSL will be available to 80% of the population (Table 1-1).

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[2] According to the FCC (1999a) report, the T1 business has a price range of $300 to $3,000 per month as opposed to the $50 to $1,000 range of DSL (depending on the variations of DSL). Thus, the telephone companies have been focusing on the high profit-generating T1 business.

Multimedia Value Chain

Apart from deployment of broadband infrastructure, content—including information products and information services—plays another critical role in multimedia industry. In light of the interdependence between content/services and transmission networks, several studies incorporated the upstream and downstream components into the value chain of multimedia.

Collis, Bane, and Bradley (1997) segmented the multimedia industry into five sectors: content, packaging, transmission, manipulation, and terminals (Figure 1-1). Colombo and Garrone (1998) also identified five major segments in the multimedia value chain: information source, information distribution, network for transmission, access to network, and terminal. Similarly, Jamison (1999) mapped out customer devices, transmission, network devices, and content as the major four components of multimedia/information industry. Elsewhere, Chakravarthy and Rodan (1999) created a typology to describe the "infocom" industry—the combination of information and communications—which consists information content primary service provider, information content supporting equipment and services, communications conduit primary service provider, and communications conduit supporting equipment and services.

The value chain flow chart demonstrates that transmission network plays a pivotal role in linking information users to information producers and service providers. From the perspective of information/service providers, transmission networks serve as the potential market size. The larger the network is, the larger the potential user population information providers can reach. From the consumer's perspective, transmission networks serve as "superhighways" through which consumers gain access to differential mix and match of information content, services, and functionalities (Jamison, 1999).

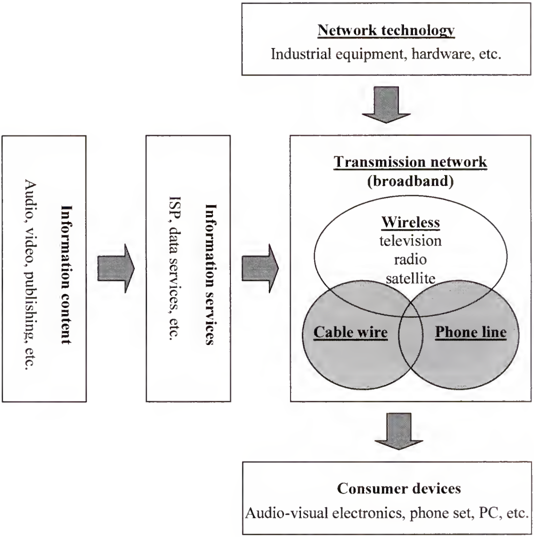

Figure 1-1. Roadmap of multimedia value chain. Note: The outline of multimedia industry is summarized by the author based on Collis, Bane, and Bradley (1997), Colombo and Garrone (1998), and Jamison (1999).

Two-Wire Competition in Multimedia Market

Given the prevalence of their network infrastructure nationwide and approximately equal position in the multimedia value chain, both cable systems and telephone companies have the potential of being the major players in the multimedia industry. On the other hand, this also brings the two industries into head-to-head competition in the emerging multimedia market (Baldwin, McVoy, & Steinfield, 1996).

As Aufderheide (1999) noted, the "two-wire solution" in promoting a facilities-based competitive marketplace reflected the two powerful incumbent forces in the new telecommunication arena (p. 44). Although cable companies have positioned themselves as potential competitors to phone companies for integrated network services, telephone carriers (especially, the Bell systems) have also offered themselves to Congress as the potential competitors in the video market. Both have been asserting the need for a level playing field in regulation.

Baldwin, McVoy, and Steinfield (1996) proposed several basic structural models of integrated service networks that involve a myriad of transmission technologies and that entail differential combinations of products and services. An important implication of the multi-player, multi-dimensional characteristics of media convergence is that the new technologies and the services have caused massive shifts and realignments in the affected industries, making alliances advisable for a stronger position in the changing marketplace (Orme, 1996). Indeed, some recent investigations have started to address the role of alliances and merger patterns in the multimedia context (Chan-Olmsted, 1998; Chan-Olmsted & Jamison, 2000; Colombo & Garrone, 1998; Colombo, Garrone, & Seri, in press).

Overview of This Study

The previous discussion reveals that the merger wave in telecommunications in the 1990s must be examined in the multimedia context. Specifically, the multimedia perspective would bring more insights into the strategic role and patterns of mergers/acquisitions in the 1990s. Furthermore, the availability of both cable modem and xDSL technologies and the existence of pervasive network infrastructure nationwide imply that the strategic import of mergers must be examined in the context of two-wire competition between cable and telephone.

Purposes of Study

Accordingly, the goal of this study is to conduct a longitudinal and comparative investigation of the strategic patterns of mergers and acquisitions in the multimedia context. For one thing, the evolving merger/acquisition dynamics and patterns over time in response to environmental changes such as deregulation and technological advancement command a longitudinal investigation. For another, the comparative aspect will provide a better understanding of how companies from different telecommunications sectors have been doing in pursuit of multimedia business opportunities.

This study has two purposes. The first part examines the different merger/acquisition patterns from 1984 through 1999 between telephone companies and cable systems. We chose year 1984 as the starting point because it is the year in which Bell systems were divested from AT&T. This provides consistency in comparing merger patterns in the 1980s and 1990s. Companies from other telecommunications sectors are not included because the telephone and cable television sectors have by far established the most pervasive end-to-end transmission facilities nationwide (FCC, 2000a, 2000b, 2000c). The comparison will allow us to examine the competition dynamics between these two industries.

To the extent that the telecommunications industries are undergoing a fundamental transformation in the multimedia context, how companies cope with substantial changes in a new competitive environment has important managerial implications. The merger trend in the multimedia context implies that cable systems and telephone companies are increasingly going beyond their core businesses. The question as to how the companies decided on what new markets to enter and in what sequence (i.e., priority) via mergers or acquisitions needs further explanation. For this matter, the second part of this study attempts to examine the factors that may affect a company's decision on selection of diversification target.

Chapter Outlines

The literature review (Chapter 2) of this study consists of three parts. The first part maps out general environmental factors that are likely to affect the merger magnitude and patterns in the telecommunications industries in the 1990s. The second part reviews literature on merger/acquisition motives and strategies. The analytical framework proposed by previous research is then applied to explore the merger/acquisition patterns in the multimedia context. The third part focuses on corporate diversification via mergers and acquisitions. Three theories on corporate behavior are reviewed to examine how a firm decides to pursue a merger in the market other than its core business. Hypotheses and research questions are formulated based on preceding literature review.

Chapter 3 lays out the research methods for this study. The analysis is primarily based on census data. Logistic regression (logit) and analysis of covariance (ANCOVA) are the two statistical procedures utilized for hypothesis testing. Chapter 4 reports the results of hypothesis testing and findings of research questions. Because this study uses census data, this chapter also focuses in detail on population description. Chapter 5 brings together conclusions from our study and discusses the managerial and regulatory implications of the findings.

Merger and acquisition activity in the multimedia context entails important managerial and regulatory consequences (Baldwin, McVoy, & Steinfield, 1996; Shaw, 2000). Probably because it is a recent phenomenon, researchers have only begun to focus on this issue. As a result, few empirical investigations exist to date. This study attempts to provide a better understanding of the implications of multimedia from a merger/acquisition perspective. It is hoped that the findings of this study would offer some insights for those who are interested in the managerial and business aspects as well as regulatory implications of the merger/acquisition trend in telecommunications.

CHAPTER 2
LITERATURE REVIEW

Merger and Acquisition Activity and Environmental Uncertainties

The desire for business expansion and corporate growth is an important motive behind merger and acquisition (M&A) activity (Penrose, 1959; Rubin, 1973). On the other hand, external factors such as changes in regulatory environment, emerging markets, threats of new competitors, and new technologies are also likely to have considerable impact on M&A dynamics (Ansoff, 1988; Bergh, 1998; Chandler, 1962; Goldberg, 1983).

In this light, two of the most noticeable changes in the telecommunications industries in the 1990s are deregulation (Aufderheide, 1999; Blackman, 1998; Campbell & Barrett, 1997; Olufs, 1999; Vogelsang & Mitchell, 1997) and the emergence of new telecommunications technologies (Baldwin, McVoy, & Steinfield, 1996; Department of Commerce [DOC], 1999, 2000; Dodds, 1995; Egan, 1996; Owen, 1999; Werbach, 1997).

Numerous telecommunication technologies such as digital compression, fiber optics, cable modem, and satellite transmission, have provided new entrants with better technological efficiencies in the competition with incumbent firms. In addition, new technologies have created new telecommunications markets such as wireless communications and the direct broadcast system (DBS). Most importantly, fast digital deployment coupled with increasing penetration of the Internet in the 1990s manifested in the emergence of multimedia services via a single-transmission technology.

To the extent that the telecommunications industries have historically been subject to tight ownership restrictions and line-of-business regulations, technological advancement and convergence alone cannot sufficiently explain M&A dynamics in the 1990s. Another important factor is deregulation in the restructuring of the telecommunications industries. Indeed, changes in the regulatory environment play a critical role in inducing the tremendous wave of business combinations (Chan-Olmsted, 1998; Drushel, 1998; Howard, 1998).

Impact of Regulatory Enforcement on M&A Magnitude

Prior studies noted that mergers and acquisitions occurred in waves (Bradley & Korn, 1981; Clark, 1985; Salter & Weinhold, 1979).[3] Reasons for this phenomenon include legal or regulatory environment such as the rigor of antitrust enforcement (Mueller, 1996; Shleifer & Vishny, 1991) or tax reform (Zey & Swenson, 1999). The change in the regulatory structure is likely to affect M&A magnitude andinfluence M&A strategies, that is, which companies to acquire or merge with in which industries. For example, mergers in the "first wave" (roughly 1890-1904) were described as the "merger for monopoly" wave, while the "second wave" from 1916 through 1929 stood as "mergers to oligopoly" (Viscusi, Vernon, & Harrington, 1996, Chapter 7). By contrast, mergers in the 1960s were mostly unrelated diversification, whereas those in the 1980s were consolidation and specialization among related industries, mostly because of the differential enforcement of antitrust policies (Shleifer & Vishny, 1991).

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[3] Shughar and Tollison (1984) did a time-series study on U.S. mergers from 1895 through 1979. However, their research results do not support the common perception that mergers occur in waves.

Telecommunications deregulation in the U.S.

In the United States, the passage of the 1996 Telecommunications Act is considered the most comprehensive overhaul of the U.S. telecommunication policy since the implementation of the Communications Act of 1934. The new law reflects broad shifts in technology use and shifts in policy approaches (Aufderheide, 1999; Olufs, 1999). Market competition and technological convergence are two of the major drivers of the new regulatory scheme. The stated objective of the 1996 Act is: "To promote competition and reduce regulation in order to secure lower prices and higher quality services for American telecommunications consumers and encourage the rapid deployment of new telecommunications technologies."[4] In order to promote competition in the telecommunications industry, regulations regarding ownership and concentration restrictions have been considerably relaxed.

Globalization of telecommunications

At the same time, the global telecommunications markets are also undergoing fundamental changes as a result of privatization and liberalization of state-owned telecommunications companies and increasing demand for seamless communications networks by multinational corporations (Gershon, 1997, 2000; Jamison, 1998, 1999; Ramamurti, 1999; Wheatley, 1999). The process of liberalization of global telecommunications market began in the mid-1980. Toward the end of the 1980s, the idea of privatizing the state-owned telephone companies had gathered steam in the developing nations, especially in Latin America.

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[4] Telecommunications Act of 1996, Pub. LA. No. 104-104, 110 Stat. 56 (1996).

The most important implication of the privatization trend worldwide is the tremendous opportunities of international expansion for U.S. telecommunications suppliers. Chakravarthy and Rodan (1999) estimated that revenues of voice transmission in the global markets would reach $287 billion in 1999, with an increase of more than 20% from 1989. The revenues were estimated to reach $360 billion in 2009. The growth rate is even more stunning in the global markets of cellular and other advanced telecommunications products. It was expected that the revenues of cellular and other advanced telecommunications services would grow to more than $250 billion in 2009, with an increase of nearly 280% from 1999 (Chakravarthy & Rodan, 1999).

In addition to the emergence of new global markets, the demand by major multinational corporations for end-to-end connections across countries via a single network is also a major driving force behind telecommunications globalization (Jamison, 1998). In light of the expanding global markets, Jamison (1998, 1999) contended that one of the key new imperatives for telecommunications companies in the 1990s is to achieve global scale. According to the author, a company can have three options to achieve international expansion. It can either choose to build new facilities in new markets, pursue mergers or acquisitions with other companies, or develop alliances.

In situations where companies choose to build new facilities, the companies would have more flexibility and freedom in choosing markets and technologies. But the building process can be slow and expensive. Moreover, this approach is also risky because the success of building into new markets is not guaranteed. Companies taking the merger and acquisition approach can have the advantages such as achieving scale quickly, having instant brand recognition in an area, and blocking competitors from making the same moves. The downside of this approach is the potential overpayment for assets and the challenge of blending corporate cultures. Furthermore, mergers and acquisitions can also trigger immediate competitive responses from other companies. With respect to alliance, the advantage is that the business partnership such as joint ventures are easier to set up and undo than mergers and can have a limited purpose and duration. This approach is most suited for situations where companies have only a limited common interest or where experimentation is needed. However, the lack of complete integration in joint ventures often make it more difficult for the companies to have control over strategic choices that meet corporate goals. Because all three options entail advantages and disadvantages one way or another, companies are likely to pursue combinations of these three options.

In summary, deregulation and globalization of telecommunications in the 1990s not only provided U.S. telecommunications companies with opportunities for domestic and international expansion, but also considerably changed business basics and strategies in the telecommunications industries (Jamison, 1998). With new business opportunities and considerably free of former regulatory constraints, telecommunications companies are actively pursuing strategic alliances to capitalize on the new opportunities of growth.

Impact of Technological Convergence on M&A Activities

Another environmental factor that is likely to have impact on M&A activity is the emergence of new technologies (Bower & Christensen, 1999; Gort, 1969; Hagedoorn, 1996; Lambe & Spekman, 1997). When the environment changes so dramatically that it results in "technological discontinuity," a firm is often forced to deal with two scenarios (Anderson & Tushman, 1990). In the first scenario, the discontinuity can be competence-enhancing, as the existing firm leverages the existing technological knowledge (or management knowledge in a broader sense) to develop competitive advantage in the new environment. When this occurs, the technological discontinuity would likely create new business opportunities for the incumbents. Alternatively, the discontinuity can be competence-destroying. In this scenario, the technological changes are so drastic that they make the existing expertise inadequate or even obsolete in the new environment. The existing knowledge base of a firm can even become a liability in the new competitive environment.

In this light, technological convergence underlying the multimedia industry can be considered as an instance of technological discontinuity that creates opportunities as well as threats for the existing telecommunications providers. Jamison (1999) pointed out three challenges that telecommunications companies have to confront in the multimedia environment. The first challenge is that a company needs to grow by combining components in new and innovative ways (e.g., by bundling services) that can differentiate itself from other competitor and capture consumer surplus. The second challenge is that the incumbents are increasingly confronted with new entrants from other industries. Because of the trend toward service bundling, different industries are increasingly spilling over into one another's territory.

Third, the desirability of offering bundled services also gives rise to the critical role of packagers such as America Online in the new telecommunication environment (Jamison, 1999). Companies such as common carriers and cable operators can serve as a wholesale market of networking, through which packagers sell services. Alternatively, telephone and cable companies can serve as a direct market selling networking as well as services directly to customers. Thus, the third challenge facing telecommunications companies is how to develop new relationship with packagers.

An important implication of technological discontinuity associated with merger activities is that the nature of the discontinuity is likely to affect M&A strategies of a firm. Addressing motives for corporate diversification, Ansoff (1988) observed that when companies are confronted with a drastic drop in sales or earnings, a technology breakthrough by competition, or a continued failure to meet profit objectives, a common reaction is to turn to other business opportunities or internationalization. One type of diversification motives, which Ansoff termed "needs-related," represents acquisition of new technology in order to enable the company to continue serving its core market. The other type, "technology-related," is to apply the historical technology of the firm to new markets and needs.

Biggadike (1979) has pointed out the importance of "relatedness"[5] between a company's existing and new activities. According to the author, "technology relatedness" is "a most likely basis for entry into other markets because corporate research often creates additional opportunities" (p. 14). Accordingly, when the technological discontinuity enhances a firm's ability for business expansion, the industrial sector that is related to the firm's technological competence is more likely to become an acquisition target.

On the other hand, when the technological discontinuity is a competence-destroying one, the existing firm is likely to confront two strategic alternatives (Ansoff, 1988). The firm may have a higher incentive to enter a new market in which the existing technology continues to possess competitive advantage. Alternatively, the firm can pursue diversification, either via acquisition, alliance, or internal development, into other new businesses.

Competences and obstacles of cable and telephone

Multimedia industry is by nature an amalgamation of different industries under the umbrella of integrated voice, video, and data services. The cable and telephone industries poised to implement integrated broadband technologies not only have an interesting opportunity to expand their products and markets but are also in a desperate position to defend their traditional markets. At the same time, successful operation in the multimedia market requires, in addition to technological knowledge, the development of interdisciplinary skills in management, marketing, and customer relationship. This means the possession of broadband technologies alone does not guarantee a competitive position in the multimedia market. What more is needed is the critical knowledge of integrating their core competences already developed in the traditional markets with the new territories.

Despite the fact that the capabilities of cable networks to go beyond video programming delivery had been recognized and explored in some instances in the early 1980s (Arlen, 1980; Esbin, 1998; Wicklein, 1980), most deployed cable systems were initially optimized for one-way transmission of video signals and were short of technological knowledge for truly two-way interactive services. The skills in

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[5] Biggadike (1979) listed five types of relatedness based on the identification of functional skills. They are technological, scale economy, marketing, vertical integration, and conglomerate. According to the author, these five types of relatedness are not necessarily mutually exclusive.

programming content management and audience marketing have taken a much important position than knowledge of conduit technologies in daily operational routines.

With respect to telephone industry, the interdependence between communications services, data processing, and computers had been recognized and discussed since the 1960s (Oxman, 1999). However, because of telephone companies had control over the critical network infrastructure, the government had historically been wary of possible anticompetitive practices such as discrimination against unaffiliated data service providers in favor of integrated ones. Thus, true integration of communications and information services was seldom realized in the past. The Bell operating companies in particular, have been closely monitored by government agencies with respect to universal services, pricing, equal access, and interconnection. Technological knowledge and network management have been the major concerns for the managers, whereas knowledge about information content and access to programming are still new territories for telephone companies (Permut, 1992).

Broadly speaking, cable operators have been generally considered as a type of editor-based mass media and largely short of technological knowledge of network management. Telephone companies, on the other hand, were historically treated as common-carriage networks, quite unfamiliar with information content management. In other words, historical factors such as regulatory structure, market characteristics, and technological development had defined the two industries distinctly and kept them separate (Table 2-1). Even though technological innovations have increasingly blurred the distinction between voice, video, and data services, path dependency suggests that incremental costs of adding services will differ across platform technologies. The historical paths of the companies' core businesses matter and are likely to affect the current corporate behaviors in terms of strategy formulation, marketing and management skills, knowledge about their customers, and perception of the competitive environment (Barrett & Burgelman, 1996; Colombo, Garrone, & Seri, in press; Teece, Rumelt, Dosi, & Winter, 1994).

Table 2-1. Regulatory background of cable and telephone industries.

	Cable systems	Telephone companies
Major U.S. telecom regulations before 1996 Act	--1972 rulemaking: promulgated rules covering broadcast signal carriage (i.e., must-carry), non-broadcast access channels, technical standards, and federal-state/local jurisdiction. --1984 Cable Act: formally established national policy concerning cable industry. Cable service was defined as one-way transmission of video programming service. Price control was removed. Cross-ownership between cable, broadcast TV station, and common carrier in the same service area was prohibited. --1992 Cable Act: price controls were reinstituted, with attempts to promote competition. Price controls were tightened in 1994.	--1956 Consent Decree: AT&T was able to keep the Bell companies and equipment manufacturer Western Electric. But AT&T was prohibited from entering unregulated markets such as computer and cable TV. --1966-1971 Computer Inquiry I: FCC initiated a series of proceedings in 1966 to distinguish communications services and data processing services. --1976-1980 Computer Inquiry II: FCC adopted rules defining enhanced services and basic services of communications. Bell companies could only provide enhanced services via structurally separated affiliates (i.e., to prevent cross-subsidization and discriminatory access to networks). --1982 Modification of Final Judgment: led to AT&T divestiture of Bell companies in 1984. AT&T was, whereas Bells were not, allowed to enter unregulated data processing or computer industries. --1985-1989 Computer Inquiry III: after AT&T divestiture, FCC initiated proceeding on regulatory framework for enhanced and basic services. Allow common carriers to offer enhanced services on an integrated basis with accounting safeguards.
1996 Telecom Act	--Price control was removed. --Restriction on horizontal concentration nationwide is relaxed. --Cable and telephone companies are allowed to enter each other's market. Combination of cable system and common carrier in the same service market is still prohibited (no larger than 10% ownership).	--Common carriers are required to provide competitors with non-discriminatory interconnection and access to their networks. --Long distance carriers are allowed to provide local telephone services. Local common carriers are allowed to provide long distance services, under some conditions. --Telephone companies are allowed to provide information services on an integrated basis, but electronic publishing is still prohibited. Ownership of information content is also prohibited.

Table 2-1—continued.

	Cable systems	Telephone companies
Early history of convergence	--Cable/broadcasting: since its inception in the 1940s to the 1960s, cable was largely viewed as ancillary to broadcast services. In the 1970s and 1980s, cable started offering original programming, and emerged as competitors against TV stations for audiences and advertisers. --Cable/data services: in the late 1970s and early 1980s, several projects of using cable wire to provide two-way interactive communications services (e.g., private line voice, data processing, and videotext) were tried. --Cable/telephony services: In the early 1990s, Time Warner companies rolled out voice services over cable networks.	--Telephone/broadcasting: AT&T acquired radio broadcasting rights through a key patent, and was active in broadcasting in the 1920s. the company treated broadcasting as common carrier. --Telephone/video services: in 1992, FCC developed video dialtone policy, permitting telephone companies to offer video distribution services on a common carrier basis to programmers, but without telephone company ownership of content. --Telephone/data services: telephone companies were able to provide data processing services via unaffiliated entities (later on, with proper non-structural safeguards such as separate accounting).

Note: The data were adopted and compiled from following sources: Arlen (1980); Baldwin, McVoy, & Steinfield (1996); Driner (1980); Drogh & Severy (1998); Marks (1998); Vogelsan & Mitchell (1997); Wicklein (1980).

Accordingly, given the different historical background and core competencies, it is virtually impossible that cable systems or telephone companies are suited to be all things to all people, even though the ideal of full integrated services of voice, video, and data represents for some an ideal concept of multimedia and policy makers are often tempted to see "two-wire solution" as an effective pro-competition mechanism in the new telecommunications environment (Jamison, 1999). In real business practice, it is more likely that cable and telephone companies would focus on niche markets under the big umbrella of multimedia and try to change themselves to match particular customers' needs. This strategy not only allows them to make the best use of their core competencies in business expansion, but also allows them to differentiate themselves and avoid head-to-head competition.

As Baldwin, McVoy, and Steinfield (1996) noted, the distinction of historical background and industry structure implies that each industry would take a different path to convergence. Translated into merger and acquisition strategy, this implies that the core competences of cable and telephone companies would have an important impact on their choices of merger targets.

Merger and Acquisition Patterns in Multimedia Context

Prior Research Approach and Methodology

In general terms, there are two approaches to examining M&A patterns. One approach, often macroeconomic and longitudinal in nature, has mostly focused attention on the concept of "merger waves" as a result of macroeconomic/market determinants such as policy changes, general economic status, and capital market activity (e.g., Golbe & White, 1988; Melicher, Ledolter, & D'Antonio, 1983; Shughart & Tollison, 1984; Shleifer & Vishny, 1991). Analysis of merger trends in this category tended to use only aggregate data and treat individual industries and companies equally (Clark, 1985; Gort, 1969).

The other approach to research on M&A patterns and strategies, more in line with managerial perspective, tended to focus on the role of industry or corporate characteristics in determining M&A patterns. Some prior studies examined factors such as strategic fit of corporate competencies, value chain interrelationships, cultural difference, and interfirm relationships in the merger behaviors and patterns (Amburgey & Miner, 1992; Brouthers & Brouthers, 2000; Haunschild, 1993; Hennart & Reddy, 1997; Lemelin, 1983; Klavan, 1990; Stewart, Harris, & Carleton, 1984; Wernerfelt, 1984).

With specific regard to the recent relaxation of ownership restrictions in the telecommunications industries, some telecommunications and media studies have addressed the policy implications of M&A activity within individual industrial sectors such as telephony, cable television, and broadcasting (Besen, Murdoch, O'Brien, Salop, & Woodbury, 1999; Brenner, 1999; Chan-Olmsted, 1996; Drushel, 1998; Howard, 1998; Roycroft, 1998). Some others have investigated the policy implications of cross-ownership relaxation, though the issue of multimedia has not been explicitly addressed (Albarran & Dimmick, 1998; Tseng & Litman, 1998).

Numerous scholars also began to examine the critical role of business combination in the shaping of the emerging multimedia industry. However, except for a few empirical investigations (Chan-Olmsted, 1998; Colombo & Garrone, 1998; Colombo, Garrone, & Seri, in press; Danowski & Choi, 1998), most of others have been case studies (Chan-Olmsted & Jamison, 2000; Lavey, 1998) or conceptual conjectures (Chakravarthy & Rodan, 1999; Collis, Band, & Bradley, 1997; Gershon, 2000; Greenstein & Khanna, 1997; Jamison, 1998; 1999; Raphael, 1998).

Colombo and Garrone (1998) studied the M&A transactions and other types of corporate partnership pursued by major telecommunications carriers from 1990 through 1995. The main thesis of the study was that telephone companies would be more likely to adopt the strategy of being a "multimedia service provider" (MSP) than follow a conservative "network operator" (NWO) strategy in the 1990s. The authors found strong empirical evidence that telecommunications carriers have increasingly embraced an MSP strategy, though there was different degree of involvement in the various stages of multimedia value chain.

Chan-Olmsted (1998) pointed out that there are two views concerning the telecommunications M&A activity in the 1990s. While one view predicted that the key to success in the new telecommunications environment is to offer a bundle of services and products that include local, long distance, video, data, and Internet access, the other view has insisted that telecommunications companies would stick to their core businesses. In the latter case, most M&A transactions would be either horizontal or vertical between firms operating in the same industries.

Chan-Olmsted (1998) compared the M&A strategies among broadcast radio, broadcast television, cable television, and telephone companies from 1991 through 1996. Although the study did not differentiate the various stages of multimedia value chain, strong support was found that the telecommunications industries have not only increased horizontal integration, but also other types of cross-segment mergers. Moreover, different sectors have shown different M&A patterns.

Danowski and Choi (1998) employed the network analysis method to examine the M&A patterns among three business areas—telecommunications (both telephony and broadcasting), data processing services, and motion pictures (including video rental)—from 1981 through 1996. The authors found that interindustry (i.e., "cross-industry") as well as intraindustry (i.e., "internal") transactions increased dramatically after 1993. Similar to Chan-Olmsted's (1998) findings, different sectors have shown very different M&A patterns. Moreover, the M&A patterns also changed over time and different sectors showed different patterns of change.

Although these empirical studies (Chan-Olmsted, 1998; Colombo & Garrone, 1998; Danowski & Choi, 1998) have brought insights into the M&A dynamics in the multimedia context, there are still some missing links. While Colombo and Garrone's (1998) study has provided a clear roadmap of the multimedia value chain, it failed to provide a comparison of M&A dynamics among other important telecommunications sectors. By contrast, Chan-Olmsted's (1998) and Danowski and Choi's (1998) studies did demonstrate the different strategic patterns among the industrial sectors, but have not included the detailed information regarding the multimedia value chain. To the extent that mergers and acquisitions in the multimedia context entail a myriad of industrial sectors, the need for more longitudinal and comparative studies calls for further investigations.

Strategic Patterns of Mergers and Acquisitions

In a recent study, Chan-Olmsted and Jamison (2000) pointed out five strategies of telecommunications alliances. The first strategy—"focus"—consists of two objectives; one is geographic focus; the other puts primacy on a particular market segment such mobile telephony. Second, companies may pursue product differentiation via business combinations to develop brand assets and marketing programs. The development of alliance can also serve to bundle complementary services—a "customer-solutions orientation" strategy—linking various firms' ability to meet a customer's demand. Fourth, the lock-in strategy is intended to achieve positive feedback through proprietary systems, although the authors admitted that this strategy may have only minor effects in some systems. Finally, companies may pursue strategic alliances to achieve scale (i.e., cost leadership), speed of entry, and scope.

To realize the aforementioned strategic objectives, a firm can pursue various types of merger or acquisition. Prior research on merger activity often classified a combination of two or more businesses into numerous types of integration depending on how the partnering businesses are positioned in the value chain (i.e., production stage), and geographical location of the market in which the firms operate.

Types of mergers

The Federal Trade Commission (FTC) classifies business combinations into three broad types: (1) horizontal mergers, (2) vertical mergers, and (3) conglomerate mergers. The conglomerate mergers are further divided into three subsets: product extension mergers, market extension mergers, and pure conglomerate (Table 2-2). However, not all combinations fall neatly into one category or the other. As new technologies evolve, the definition may change (Chan-Olmsted, 1998; Whalen & Litman, 1997). At issue is the new media environment, which, as a result of increasing convergence, practically defies a clear-cut classification. For example, some industries such as computer hardware/software and information services that were formerly regarded as unrelated to the communications industry are now virtually in a more or less a vertical relationship.

Chan-Olmsted (1998) indicated four types of merger transactions and the respective benefits. First, a company can choose to acquire or merge with another one in the same production stage, that is, to adopt a horizontal integration. A merger between two cable systems, for instance, is classified as this type.[6] The potential benefits of horizontal integration are scale economies and increase in market power. The second type of merger is vertical integration of two firms in a supplier-buyer relationship. This strategy is said to ensure acquisition of important resources or access to distribution channels, and control over product specifications.

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[6] Note that this example can actually have two definitions based on the FTC's criteria. If the two cable systems were in the same franchise area (i.e., overbuild), the merger is considered a horizontal one. This

Table 2-2. Classification scheme of merger/acquisition types and examples.

Primary category	Definition and variation	Examples
Horizontal integration: Merged companies produced the same products/services (i.e., at the same production stage).	-Pure horizontal if the merged companies initially operated in the same geographic market (i.e., merger between competitors) -Market extension if the merged companies initially operated in different locations.	A merger between two cable systems in the same franchise area (or in different services areas)
Vertical integration: Merged companies had a potential buyer-seller relationship prior to the merger.	-Backward integration allows the acquiring firm to extend operation in the direction of supplier. -Forward integration allows the acquiring firm to extend operation in the direction of consumer.	A merger between a common carrier and telephone equipment manufacturer
Conglomerate integration: Other types of business combinations than horizontal and vertical integration.	-Product extension when the merged companies were functionally related in production and/or distribution, but sell products that do not compete directly with one another.	A merger between a cable system and a television station
	-Pure conglomerate involves the consolidation of two essentially unrelated firms.	A merger between a cable system and a PC maker
	-Concentric integration when merged companies were related through basic technologies, production processes, or markets. -Concentric technology: merged firms use same technology for different customer types. -Concentric marketing: merged firms offer same customer types of products/services using different technologies.	A merger between a common carrier and a cable system

As far as the multimedia industry is concerned, this often means the integration of content production, manipulation, distribution, and exhibition. For example, Time

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type of merger is closely monitored and often discouraged by antitrust laws. If the two systems are in different service areas, it is treated by the FTC as market extension.

Warner owns production studios (production), WB Network (distribution), and cable systems (exhibition). The recent proposed merger between Time Warner and America Online (AOL) represents the stage of content manipulation. In terms of benefits, vertical integration often results in considerable economic efficiencies (Clark, 1985). Moreover, vertically integrated incumbents often create higher entry barriers, making it more difficult for new entrants without vertical integration to compete effectively (Porter, 1985).

The third type is concentric integration, which refers to a situation in which "the acquiring and target firms are related through basic technologies, production processes, or markets" (Chan-Olmsted, 1998, p. 37). In practical terms, this is a new type of merger that is beyond the FTC's criteria. The acquired firm represents an extension of business line or an expansion into a new market that is technologically related.

Whalen and Litman (1997) have indicated that a concentric integration can be based on concentric technology, which means the merging firms use the same technology for different customer types. It can also be based on concentric marketing, which allows the merging firms to offer same types of products/services using different technologies. An important implication of concentric integration is its relevance to multimedia business, which reflects the current phenomenon of diversification into the multimedia industry through mergers and acquisitions. For example, the merger between a telephone company and a cable company has the potential to offer multimedia services to customers via phone lines or cable wires. Benefits of this type of integration include economies of scope and diversification based on common core resources, the latter of which will likely ease entries into new but related markets.

The last type of integration is called conglomerate diversification, which consists of pure conglomerate diversification, product extension, and market extension. The pure conglomerate diversification (called unrelated diversification by Rumelt, 1982; Biggadike, 1979) is intended to enhance the overall stability and balance of a firm's total portfolio without any specific consideration of shared resources, technologies, or product-market relations (Chan-Olmsted, 1998). This type of diversification very often stresses the attractiveness (e.g., profitability and market growth) of the market in which the target firm is operating. One of the most well known models relevant to this viewpoint is the product/market-portfolio model developed by the Boston Consulting Group (BCG) (Salter & Weinhold, 1979, chapter 4). One of the underlying strategies of the BCG model is to move through mergers and acquisitions from the low-growth and low cash-generating market into the high-growth and profitable market.

The other alternatives under the conglomerate diversification category are product extension and market extension. The former means an addition of complementary products to the existing product line, whereas the latter means the expansion of market size in different geographic locations (Clark, 1985). The different types of M&A strategic patterns and the outline of multimedia value chain proposed by previous studies, thus, provide a useful framework for the exploration of the merger and acquisition trend in the multimedia context.

Exploring changes in M&A patterns

The previous discussions have pointed out that merger trends and patterns are likely influenced by the changes in the external environment. As a result of telecommunications deregulation in the United States, emergence of new markets, telecommunication globalization, and increasing penetration of new telecommunications technologies, the telecommunications industries in the U.S. underwent drastic changes in the 1990s. On one hand, the incumbent cable and telephone companies are increasingly facing strong competition from new entrants and new communications technologies in their core markets. As competition intensifies, companies are often confronted with drops in sales or earnings. Ansoff (1988) noted that when a firm is faced with continued failure to meet profit objectives, a common reaction is to turn to other business opportunities or international markets. Previous literature review also suggests that merger and acquisition serves as a means for companies to enter a new market more quickly, and is less risky than internal expansion (Jamison, 1999). This implies that cable or telephone companies facing slower revenue or income growth would have higher incentive to pursue diversification and international expansion via mergers and acquisitions.

On the other hand, market deregulation and relaxed line-of-business restrictions in telecommunications in the 1990s means that cable and telephone companies have more flexibility and freedom to enter new markets that had previously been blocked off by regulations. Simultaneously, the increasing liberalization and privatization of global telecommunications in the 1990s and increasing demand for seamless global telecommunications services also provide incumbents with new business opportunities (Jamison, 1998; Gershon 2000; Chan-Olmsted & Jamison, 2001). Under these circumstances, cable and telephone companies would be more likely to pursue diversification and international expansion in the 1990s than in the 1980s.

Hypothesis 1a) Cable and telephone companies in the U.S. are more likely to adopt diversifying M&A strategies in the 1990s than in the 1980s.

Hypothesis 1b) Cable and telephone companies faced with slower business growth in the U.S. are more likely to pursue diversification strategies.

Hypothesis 1c) Cable and telephone companies in the U.S. are more likely to pursue international expansion in the 1990s than in the 1980s.

Hypothesis 1d) Cable and telephone companies faced with slower business growth in the U.S. are more likely to pursue international expansion.

Factors Affecting Selection of Diversification Targets

Previous discussion focused on the environmental factors that might have impacted the magnitude and patterns of merger and acquisition (M&A) activities. Specifically, we expected that cable and telephone companies were more likely to pursue diversification and international expansion via mergers and acquisitions in the 1990s because of deregulation in the U.S., increasing competition in telecommunications, emergence of multimedia markets, and liberalization and privatization of global telecommunications markets. We also hypothesized that cable and telephone companies faced with slower revenue and income growth in the domestic markets would have higher incentive to pursue diversification and international expansion.

Given the incentives to pursue corporate diversification, it is necessary to understand the factors that might have influenced the companies' selection of merger targets. More specifically, we need to examine what the criteria were that a firm might take into account when it decided to enter a new market through M&A.

The decision to enter a new market through merger/acquisition is a complex process; it involves, among other things, defining objectives, setting goals, environment scanning, detection of opportunities, and information gathering, before a final decision is made (Dory, 1978). Moreover, the decision-making process is often further complicated by the interdependencies between internal structure and resources of a firm and the environmental structure it is facing (Edstrom, Hogberg, & Norback, 1983).

Salter and Weinhold (1979) proposed three general but related models in the discussion of corporate diversification strategies. The product/market-portfolio model emphasizes the attractiveness of the target market in terms of attributes such as market size, growth rate, and profitability. The strategy model stresses the interrelationship between the core-business market and the target market. The third approach, risk/return model, derives mainly from financial theories and reflects the concerns and interest of investors. Because the financial aspect of corporate diversification is not of primary concern for this study, the risk/return model is not further discussed.

The models proposed by Salter and Weinhold (1979) generally assume a firm to be active in seeking diversification opportunities. Some previous studies on corporate behavior, however, suggested that a company's diversification decision may be a result of seeing what the other competitors are doing. This mimic behavior is due to the manager's insufficient information on the new market or underdeveloped management and marketing knowledge of the new market (Doucouliagos, 1996; Greve, 1998; Haunschild, 1993; Haveman, 1993). As such, the present study also attempted to examine cable and telephone companies' diversification patterns from this perspective. Figure 2-1 provides a visual display of the three models adopted for analysis in this study.

The Product/Market-Portfolio Model

The product/market-portfolio model puts primacy on the overall economic characteristics of a company's portfolio of business. The most important consideration underlying this model is which market to invest in that can offer the highest profit. This model addresses objectives of diversification in terms of growth, profitability, and reduction of vulnerability to technical or political discontinuity (Ansoff, 1988). Earlier examples of this model include the PIMS (profit impact of marketing strategy) model developed by the Marketing Science Institute and another variant developed by the Boston Consulting Group (BCG).

According to these variants, factors influencing industry attractiveness in the market are of utmost importance in the formulation of diversification strategy. The degree of attractiveness of an industry is commonly measured by its market size, market growth rate, profitability, number of competitors, or position in product life cycle (Salter & Weinhold, 1979).

Based on the product/market-portfolio model, a firm's decision to enter a new market is a function of the degree of market attractiveness. This study utilizes market growth rate and potential of profitability as the variables to test the model.

> Hypothesis 2a) Cable and telephone companies in the U.S. are more likely to acquire target firms in markets with high profitability.
>
> Hypothesis 2b) Cable and telephone companies in the U.S. are more likely to acquire target firms in markets with high growth rates.

Apart from industry attractiveness in terms of profitability, growth prospects, and market size, prior research also attempted to investigate the motives behind corporate diversification from the technological perspective. Hagedoorn and Sadowski (1999) have identified market entry-based and technology-based motives for strategic alliance and corporate diversification. Whereas the market-entry incentives refer to the effort to create new markets and international expansion, the technology-based motives emphasize the need for technological partnership to reduce and share uncertainty in the increased complexity and inter-sectoral nature of new technologies.

Indeed, both the market entry-based and technology-based views are critical in the new media environment because technological convergence has created for the incumbents a wide range of new business opportunities that have existed in different sectors using different technologies and skills (Baldwin, McVoy & Steinfield, 1996; Collis, Bane & Bradley, 1997; Greenstein & Khanna, 1997; Masud, 1998; Tseng & Litman, 1998). On one hand, mergers with or acquisitions of existing firms allow the acquiring companies not only to enter new markets more quickly but also to reduce risks of starting from scratch in new markets. Moreover, prior research has pointed out that managers often perceive rapid expansion into a new market as a critical element of long-term competitive advantage (James, 2000, February 28; Song, di Benedetto, & Zhao, 1999), though results of empirical studies have been inconsistent (Lambkin, 1988; Lilien & Yoon, 1990; Miller, Gartner, & Wilson, 1989; Mitchell, 1991; Sarkar, Cavusgil, & Aulakh, 1999; Tellis & Golder, 1996; Urban, Carter, Gaskin, & Mucha, 1986).

On the other hand, while digitization has blurred boundaries of the initially discrete sectors of the telecommunications industry, some sector-specific technological knowledge still need be learned if multimedia business is the ultimate goal in the new media environment (Colombo, Garrone, & Serie, in press). Although firms can learn the skills or develop the technological expertise from scratch during the process of business operation, acquisitions of existing firms also provide an efficient way to obtain the necessary technological knowledge and market-specific management skills.

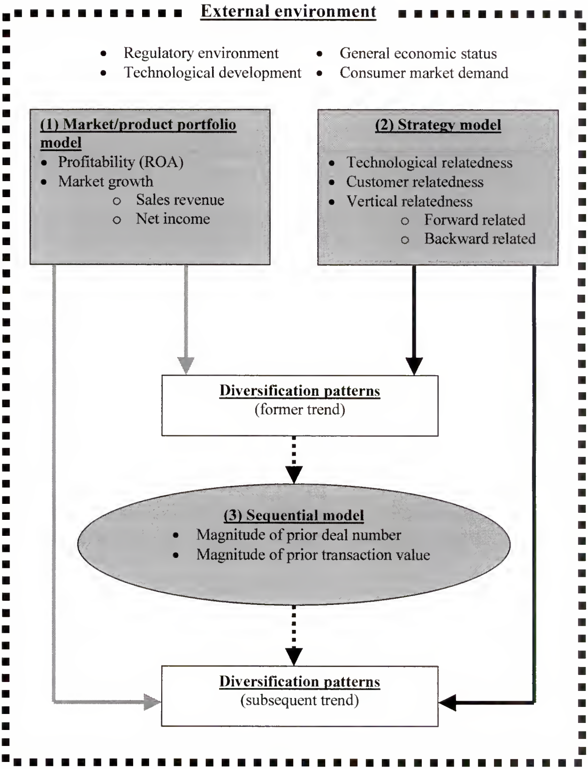

Figure 2-1. Visual display of analytical models.

The Strategy Model

To the extent that acquisition of technological knowledge and management skills is an important incentive behind corporate diversification, it is necessary to have a better understanding of how the technological aspect might have influenced a company's selection of merger target.

The second model proposed by Salter and Weinhold (1979) stresses the strategic goal of a diversification. Of specific importance in the diversification strategy is how the target firm or the target sector is related to the core business of the acquiring firm, and how the acquiring firm can benefit from this interrelationship (Ansoff, 1988; Biggadike, 1979). Porter (1985) also has treated diversification into related markets as a means of gaining competitive advantage. Prior empirical studies found that related diversifiers often outperformed the unrelated diversifiers (Montgomery & Singh, 1984; Palepu, 1985; Rumelt, 1982). With respect to merger and acquisition strategies, the degree of commonality between the acquiring firm and the target sector is also found to be positively related to profitability (Akhavein, Beger, & Huymphrey, 1997; Kusewitt, 1985; Shelton, 1988).

Resource-based view on diversification

Unlike the product/market-portfolio model whose focus is primarily on the financial aspects of the target market, the strategy model looks at the interrelation between the market of the acquiring firm and that of the acquired firm. As such, the strategy model is most relevant to the resource-based view on corporate diversification, which assumes a firm to be seeking new diversification or growth opportunities to extend its established corporate competencies into new businesses (Das & Teng, 2000; Peteraf, 1993; Wernerfelf, 1984).

The concept of resource can be traced back to Penrose (1959), who defined a firm as "a collection of productive resources" (p. 24). Resource possessed by a firm can be both tangible, such as human resources, capital, and production facilities, and intangible, such as production experience, management skills, and technological capabilities. Relating resource-based view to merger and acquisition, Wernerfelt (1984) claimed that mergers and acquisitions are likely to provide an opportunity for firms to trade otherwise non-marketable resources and to buy or sell resources in bundles. A key point in the application of resource-based view to acquisition strategy is that a given target firm will have different values for different buyers. The desirability of a target firm in the resource-based view is the degree of "strategic relatedness" between the two businesses (Peteraf, 1993; Teece, Rumelt, Dosi, & Winter, 1994).

Markides and Williamson (1996) have argued that the core competence (i.e., the collection of resources) accumulated by a firm in operating a business can be transferred to another line of business, though the benefits of the core competence may not be obvious on the surface when the two businesses are viewed from the product-based perspective. The authors use "dynamic relatedness" to describe the core competence or strategic assets that link the two or more businesses. Several studies in this tradition have attempted to conceptualize the "strategic fit." Markides and Williamson (1996) suggested five broad indicators of strategic assets: (1) customer assets, such as brand recognition and customer loyalty; (2) channel assets, such as established distributor loyalty and pipeline stock; (3) input assets, such as knowledge of imperfect factor markets, supplier loyalty, and financial capacity; (4) process assets, such as proprietary technology, marketing, and production experience; and (5) market knowledge, such as information of competitors, price elasticity of demand, and market response. In a similar vein, Biggadike (1979) proposed five types of relatedness in his study about corporate diversification strategies These include: (1) technological skills; (2) scale economy, which refers to similarity in manufacturing processes and facilities; (3) marketing, which is associated with customer management skills; (4) vertical integration; and (5) conglomerate relatedness, which is associated with the financial strength of the parent company and the attractiveness (i.e., growth) of a new market.

Although the resource-based view focuses on the strategic fit between two firms, several empirical investigations in this tradition have also applied this concept to industry level. Farjoun (1994) examined the impact of similar human expertise such as management and marketing skills on corporate diversification patterns within industry groups. Klavans (1990) found that, in addition to human expertise, resource dependency (i.e., vertical relationship) is also likely to affect a company's selection of target for acquisition. Likewise, Lamelin (1983) found that vertical relatedness is a significant factor in explaining patterns of interindustry diversification.

Based on the strategy model, a firm's selection of a target is a function of the commonality between the core business of the acquiring firm and the industry in which the target firm is operating. The relatedness can be based on technology, customer base, or vertical relation including backward related and forward relatedness. Accordingly, we expected that cable and telephone companies would be more likely to pursue diversification in the markets that are related to their core businesses in different ways.

Hypothesis 3a) Cable and telephone companies in the U.S. are more likely to acquire the targets in technology-related markets.

Hypothesis 3b) Cable and telephone companies in the U.S are more likely to acquire the targets in customer-related markets.

Hypothesis 3c) Cable and telephone companies in the U.S. are more likely to acquire targets in vertically related markets.

Generally speaking, the product/market-portfolio model and strategy model proposed by Salter and Weinhold (1979) assume that a firm actively seeks new business opportunities for diversification either. The former model suggests that a firm chooses to enter a specific new market because it is a rapidly growing market or because it provides the acquirer with new source of income. The latter model suggests that the new market provides the acquiring firm with the opportunity to extend its established corporate competencies into a new market. In contrast to this view, another approach to merger and acquisition activity often regards a firm as a somewhat passive or conservative economic agent which acts in response to environmental changes by mimicking other similar or leading (e.g., large or successful) organizations in the same industry (Haveman, 1993).

Impact of Prior Mergers on Subsequent Ones

A number of prior studies have demonstrated that a merger/acquisition pursued by a company may be a competitive response of the company simply because another company acted first. For example, Caves (1991) has found that one merger may trigger another one among rival firms. Nilssen and Sorgard (1998) also have viewed the merger waves from the sequential perspective and concluded that merger decisions by acquirers are often interrelated over time. That is, mergers may occur in waves because of the impact of former mergers on the subsequent ones.

In the same vein, several researchers adopted the sequential perspective to investigate vertical mergers (Bolton & Whinston, 1991; Colangelo, 1995; Hart & Tirole, 1990; Ordove, Saloner, & Salop, 1990). A major assumption of these studies is that the strategic motive underlying a vertical merger between an upstream and a downstream firm is market foreclosure. In response, a rival firm is likely to take the same action.

Mimetic isomorphic view on corporate diversification

Although the sequential view on merger activity revealed the phenomenon that prior mergers may trigger subsequent ones, it has not explicitly addressed the question as whether the prior mergers might also affect the subsequent ones in terms of the selection of target sectors. To answer this question, this study cites the view of interfirm isomorphism on corporate behavior (Barr, Stimpert, & Huff, 1992; DiMaggio & Powell, 1983; Haveman, 1993; Reger & Huff, 1993).

Theorists in this tradition explicitly recognize a firm's cognitive limitation in making a diversification decision (Greve, 1998; Haveman, 1993). Greve (1998) has argued that the best practice by a manager to resolve the uncertainty is to gather hard data on the market such as corporate performance statistics; however, such data are often difficult to find. Thus, the second best kind of information is what the other companies are doing.

As a consequence of limited technological knowledge, underdeveloped management skills, and insufficient information about a new market, managers often try to create "mental models" of the new environment to simplify the cognitive task of understanding their strategic position (Daft & Weick, 1984; Kiesler & Sproull, 1982; Proac & Thomas, 1990; Reger & Huff, 1993). This process is often performed by grouping together and following the strategies by other organizations that are similar on important characteristics in the same industry, a tendency sometimes referred to as "herd mentality" (Doucouliagos, 1996).

DiMaggio and Powell's (1983) seminal paper has pointed out that "institutional isomorphism" might originate from three different, though often interrelated mechanisms. All the three mechanisms properly reflect the current situation of multimedia industry. First, coercive isomorphism is likely to result from pressures, both formal and informal, that are exerted upon an organization by other organizations on which its operation depends. An obvious example is the existence of a common legal environment that affects many aspects of an organization's behavior and structure. The second mechanism is called mimetic isomorphism within the industry when, for example, the organizational technologies are poorly understood, institutional goals are ambiguous, or the environment creates uncertainties. Under these circumstances, organizations are very likely to model their strategies after similar organizations in their field that they perceive to be more legitimate or successful. The third mechanism, termed normative isomorphism, often stems from "professionalization." Two important sources of this professionalization, according to DiMaggio and Powell, are formal education, for one, and the growth of professional networks such as trade associations and technological consortia, for the other. Thus, according to this theory, a company is more likely to pursue the same M&A strategy that has been repeated over time by other companies that are perceived to be similar in market characteristics.

To sum up, the isomorphism view on corporate diversification implies that companies in the same industry tend to have similar selection of target markets. They are likely to follow what the other companies have been doing in the past. This means that previous merger/acquisition magnitude and pattern in the cable and telephone industries would have considerable impact on the selection of merger targets by other cable and telephone in the later period. That is, the more often a certain target market is pursued previously, the more likely it would be pursued by later acquirers.

Hypothesis 4) The selection of target markets by cable or telephone companies for diversification is positively related to prior acquisition patterns of other firms in the same industry.

The previous hypotheses show the situation that a company's diversification decision can be affected by a wide variety of factors, such as the profitability and growth prospects of the new market and the interrelation between the core business of the acquiring firm and the new market. Concurrently, the diversification can also be influenced by the merger/acquisition activities of competitors. In light of the wide variety of factors, it is, thus, important to examine which factors play a more influential role. In addition, because of the different regulatory structure, market nature, and technological characteristics between cable TV and telephony, it is important to examine whether the same factors have the similar impact on cable and telephone companies?

R. Q. 1) Which factor or factors can explain better the selection of diversification targets by cable and telephone companies in the U.S.?

R. Q. 2) Do the same factors have similar impact on cable systems and telephone companies?

The present study attempted to examine the important factors that might have influenced the merger/acquisition decisions of cable and telephone companies, especially with regards to their selection of diversification targets. Another important aspect of the merger wave in telecommunications in the 1990s that calls for better understanding is its relation to the emergence of multimedia industry. For this matter, the other purpose of this study is to explore the merger and acquisition patterns of the cable and telephone industries in the multimedia context. Specifically, because of the wide range of industries and business opportunities involved in the composition of multimedia industry, we believe that it is necessary to have a detailed exploration of merger/acquisition strategies of the cable and telephone industries. To achieve this goal, the analysis is primarily based on empirical data.

R. Q. 3) How do cable systems and telephone companies differ in their M&A strategies in the multimedia context?

R. Q. 4) What are the industrial sectors most attractive to cable operators and telephone companies in the multimedia context?

CHAPTER 3
METHODOLOGY

Research Overview

This research is a longitudinal and comparative study on the merger/acquisition (M&A) strategies by cable operators and telephone companies in the multimedia context. The unit of analysis is a cable or telephone company for the first part (i.e., H1a through H1d), and the industry for the second part (i.e., H2, H3, and H4). Because we also attempted to explore in detail the selection of merger targets by cable and telephone companies in the multimedia context, a comprehensive database is required. Accordingly, this study uses census data instead of a random sample.

Research Population and Census Data

The population of this study is all mergers and acquisitions completed by U.S.-based cable systems and telephone companies from 1984 through 1999. All identified mergers/acquisitions were coded as multimedia-related or non-multimedia-related. Because there are multiple definitions for multimedia industry, the selection of multimedia-related industries was based on several government documents and previous studies that focused on the issue of multimedia, information, or media convergence.

The major documents that provided detailed listing of multimedia-related sectors included the following:

(1) a study on media conglomerates (Albarran & Dimmick, 1996);

(2) an examination of the convergence of information and communications (Chakravarthy & Rodan, 1999);

(3) two government reports released by the Department of Commerce on information technology industries (DOC, 1999, 2000); and

(4) the definition of information industry based the North American Industry Classification System (NAICS) released by the U.S. Census Bureau.[7]

Other similar studies (Collis, Band, & Bradley, 1997; Colombo & Garrone, 1998; Jamison, 1999) were also taken into consideration in defining the multimedia market boundary, though these studies did not provide detailed industry lists.

Because each document took a slightly different approach to the definition of multimedia industry, altogether more than 56 individual sectors were documented that were one way or another related to information or multimedia (Table 3-1). In order to make the data more consistent, we decided that each sector must be mentioned at least by two of the four principal data sources in order to be treated as multimedia-related. Several sectors that are more related to information technology, such as semiconductors and circuit boards, and some sectors, such as greeting cards and ad agencies, were decided as not consistent with this study and were not included in the sample. This resulted in a total of 42 sectors as the multimedia-related sectors for this study. All the mergers and acquisitions completed by cable and telephone companies during the 16 years under investigation were coded based on the selected multimedia-related sectors, using SIC codes.

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[7] The NAICS code system was unveiled in 1997 to reflect the increasingly changed features of the U.S. industries as a consequence of technological advances. The new system is created to accommodate the inadequacy of the conventional SIC system. NAICS regroups the general economy into 20 broad sectors from the ten divisions of the existing SIC system. Some sectors are regroupings of parts of the SIC divisions to form new sectors. Some sectors, such as transportation and utilities, still largely reflect the

Table 3-1. List of selected multimedia-related industries.

SIC codes	Description	Infocom industry	Mass media industry	IT industry	Info industry (NAICS)
2711	Newspaper	X	X		X
2721	Periodicals/magazines	X	X		X
2731	Book publishing	X	X		X
2732*	Book printing	X			
2741	Miscellaneous publishing		X		X
2771*	Greeting cards				X
3571	Electronic computers	X		X	
3572	Computer storage devices	X		X	
3575	Computer terminals	X		X	
3577	Computer peripheral equipment	X		X	
3578-9*	Calculating/office machines			X	
3613*	Switchgear/switchboard apparatus	X			
3651	Household audio/video equipment	X		X	
3652	Prerecorded records/tapes	X	X		X
3661	Telephone/telegraph apparatus	X		X	
3663	Radio/TV communications equipment	X		X	
3669	Communications equipment	X		X	
3671*	Electron tubes			X	
3672*	Printed circuit boards			X	
3674*	Semiconductors			X	
3675-9*	Passive electronic components			X	

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major components of the SIC system. NAICS uses a six-digit code to identify industries as opposed to the four-digit SIC system.

Table 3-1—continued.

SIC codes	Description	Infocom industry	Mass media industry	IT industry	Info industry (NAICS)
3695	Magnetic/optical recording media	X		X	
3823*	Industrial instruments for measurement			X	
3825*	Instruments for measuring electricity			X	
3826*	Laboratory analytical instruments			X	
4812	Radiotelephone communications	X		X	X
4813	Telephone communications	X		X	X
4822	Telegraph/other communications	X		X	X
4832	Radio broadcasting stations	X	X	X	X
4833	Television broadcasting stations	X	X	X	X
4841	Cable/pay TV services	X	X	X	X
4899	Communications services	X		X	X
5045	Computers, peripherals, software	X		X	
5734	Computer/software retail			X	
7331*	Direct mail ad services				X
7371	Computer programming services	X		X	
7372	Prepackaged software	X		X	X
7373	Computer integrated systems design	X		X	
7374	Data processing/preparation	X		X	X
7375	Information retrieval services	X	X	X	X
7376	Computer facilities management	X		X	
7377	Computer rental/leasing	X		X	
7378	Computer maintenance/ repair	X		X	

Table 3-1—continued.

SIC codes	Description	Infocom industry	Mass media industry	IT industry	Info industry (NAICS)
7379	Computer related service	X		X	X
7383	News syndicates				X
7389	Recording studios/audio taping/info services.		X		X
7812	Motion picture/video production	X	X		X
7819	Services allied to motion pictures	X	X		X
7822	Motion picture/tape distribution	X	X		X
7829	Motion picture distribution services	X	X		X
7832	Motion picture theaters, except drive-in	X	X		X
7833*	Drive-in motion picture theaters				X
7841	Video tape rental	X	X		
7922	Theatrical producers (except motion pictures.)				X
7311*	Advertising agencies		X		
8999	Record production services/miscellaneous		X		X

NOTE: The table was summarized by the author based on the "Infocom" industry typology proposed by Chakravarthy and Rodan (1999), media conglomerate (Albarran & Dimmick, 1996), DOC's (1999, 2000) reports on the development of information technology, and the information industry defined by the 1997 NAICS code system. Industries with the "*" mark are not regarded as multimedia-related and not included in the data. These sectors are either more related to information technology or are not covered by most studies.

Mergers and acquisitions coded as multimedia-related were further classified into seven categories, mostly based on the SIC codes. Table 3-2 summarizes the grouping results. Although the categorization is arbitrary to some extent, the largely similar SIC codes in each category suggest that the grouping is adequate.

Data sources and coding scheme

The major archival data source is the merger/acquisition database (SDC Platinum) complied by Securities Data Co. The database includes all corporate transactions, private as well as public ones, that involve at least 5% of the ownership of a company with transaction valued at $1 million or more. Transactions involving at least 5% of ownership but without available data of transaction value are also included. Starting from 1992, all transactions of any value are included in the database, provided that the transactions involve at least 5% of ownership.

Merger/acquisition data recorded for analysis included: (1) year in which the transaction was completed, (2) the acquiring firm's name, business description, and SIC code, (3) the target firm's name, nationality, business description, and SIC code, and (4) transaction value if available. Other data such as corporate revenues, market size, and market growth rates, were collected from other existing databases such as government documents and corporate data compiled by private for-profit organizations. The database Industry Norms and Key Business Ratios compiled by Dun & Bradstreet Corporation is the major source for industry-level financial data. Two databases of Ward's Business Directory published by Gale Group and Directory of Corporate Affiliations by National Register Publishing are the major sources of corporate-level financial data.

Variable Operationalization and Measurement

The goal of this study is to explore the merger/acquisition strategies by the cable systems and telephone companies, and to examine the impact of numerous factors on merger/acquisition decisions. This study proposed several factors that might have impact on a company's merger/acquisition decision. These included changes in regulatory environment, business status of the acquiring firms, attractiveness of target markets, the relationships between the acquiring and target industries, and the impact of prior merger patterns. Table 3-3 presents the summary of operational definitions and measurement.

Table 3-2. Classification of multimedia sectors.

Sector		SIC	Description
Multimedia-related Sectors	Audio-visual sector	7389	Recording studios/audio taping/info services.
		7812	Motion picture/video production
		7819	Services allied to motion pictures
		7822	Motion picture/tape distribution
		7829	Motion picture distribution services
		7832	Motion picture theaters
		7841	Video tape rental
		7922	Theatrical producers (except motion pictures.)
		8999	Record production services/miscellaneous
	Communication equipment	3651	Household audio/video equipment
		3652	Prerecorded records/tapes
		3661	Telephone/telegraph apparatus
		3663	Radio/TV communications equipment
		3669	Communications equipment
		3695	Magnetic/optical recording media
	Electronic media service	4832	Radio broadcasting stations
		4833	Television broadcasting stations
		4841	Cable/pay TV services
	Computer	3571	Electronic computers
		3572	Computer storage devices
		3575	Computer terminals
		3577	Computer peripheral equipment
		5045	Computers, peripherals, software
		5734	Computer/software retail
Multimedia-related Sectors	Information service	7371	Computer programming
		7372	Prepackaged software
		7373	Computer integrated systems design
		7374	Data processing/preparation
		7375	Information retrieval services
		7376	Computer facilities management
		7377	Computer rental/leasing
		7378	Computer maintenance
		7379	Computer related service
	Print media	2711	Newspaper
		2721	Periodicals/magazines
		2731	Book publishing
		2741	Miscellaneous publishing
	Telecom service	4812	Radiotelephone communications
		4813	Telephone communications
		4822	Telegraph/other communications
		4899	Communications services
Non multimedia-related sectors		All other sectors	

Regulatory environment

This study used dummy variables to capture the impact of regulatory environment. Since the divestiture of AT&T and passage of the 1984 Cable Act in 1984, telecommunications concerning the telephone and cable industries have underwent several amendments at different points in time. Table 2-1 in Chapter 2 provides a brief history of the major changes in telecommunications policy concerning the cable and telephone industries. For example, the series of Computer Inquiry III proceedings after AT&T's divestiture gradually allowed common carriers, in particular the Bell companies, to provide data processing services on an integrated basis in the 1990s. Restrictions on vertical integration of communications equipment and services also were relaxed. On the other hand, the FCC decided to reinstitute price control on cable services in 1992 (i.e., the 1992 Cable Act), even though the earlier 1984 Cable Act was largely considered as deregulation of the cable market. Again, telecommunications were considerably deregulated in 1996 when the new Telecommunications Act was signed into law. Because it is impossible to quantify regulatory changes, the 16 years from 1984 to 1999 under investigation was divided into three periods—1984-1989, 1990-1995, and 1996-1999—to represent the different time periods that roughly capture the impact of regulatory changes. This resulted in two dummy variables PERIOD1 and PERIOD2.

In addition, because the cable and telephone industries are subject to different regulatory framework, another dummy variable (ACQUIRE) was used to capture the different regulatory schemes. This dummy also served to represent the different market nature and technological characteristics between the cable and telephone industries.

Business status of acquiring firms

This study used two interval variables to reflect two aspects of business status of the acquiring firms. First, three-year average of revenue growth rate prior to merger completion (SALEG) represented the history of growth prospect of the acquiring firm in terms of sales volume. Second, three-year average of net income growth rate prior to merger completion (INCOG) represented the ability of the acquiring firm to generate profit.

Table 3-3. Operational definitions and measurement of variables.

Variable		Operational definition/measurement
Regulatory changes	PERIOD1	1984-1989 = 1; otherwise = 0
	PERIOD2	1990-1995 = 1; otherwise = 0
	ACQUIRE	Cable = 1; telephone = 0
Business status of acquirer	SALEG	3-year average of annual revenue growth rate of the acquiring company prior to merger completion year
	INCOG	3-year average of annual net income growth rate of the acquiring company prior to merger completion year
Target market attractiveness	SALELOG	3-year average of annual sales revenue of a target industry prior to merger completion year
	SALEGRO	3-year average of annual sales growth rate of a target industry prior to merger completion year
	NETGROA	3-year average of annual income growth rate of a target industry prior to merger completion year
	ROAAVG	3-year average of annual return on assets (ROA) of a target industry prior to merger completion year
Acquirer-target relatedness	CUSTOME	Similar customer type = 1; otherwise = 0
	FORWARD	Based on input-output indices of U.S. industries (DOC, 1998)
	BACKWAR	Based on input-output indices of U.S. industries (DOC, 1998)
	SICSIM	Based on four-digit SIC; within three-digit group = 2; within two-digit group = 1; otherwise = 0
Impact of prior mergers	CUMVALU	Total value of transactions completed by cable or telephone in a certain target sector in the past three years
	CUMNUMB	Total number of transactions completed by cable or telephone in a target sector in the past three years

It should be noted that these two aspects are not necessarily highly related, and both sales and income stream could play an important role in managerial decision for corporate expansion (Ansoff, 1988). Sales revenue does not factor in sales costs or other administrative expenses. Thus, corporate expansion via a merger or acquisition may help the acquirer to increase sales revenues, but it does not necessarily also increase profit for the company. A manager faced with slow sales growth may have higher incentive to pursue business combinations because it helps to pump up sales volume quickly.

On the other hand, net income factors in operating, administrative, and interest expenses. The prospect of net income growth (i.e., the bottom line) of a company is often what stockholders pay close attention to, as it commonly determines the expected dividends (Redmond & Trager, 1998, chapter 9). Thus, when a company is confronted with slow income growth or even losses, pressures from stockholders may also be an important reason for a manager's decision to pursue mergers.

Attractiveness of merger target industries

Three interval variables—revenue growth rate, profit growth rate, and return on assets—were used to capture the different aspects of attractiveness of a merger target industry. The variable SALEGRO, which represented three-year average of annual growth rate prior to merger completion, was used to capture the growth prospect of a target market. The variable NETGROA, which represented three-year average of annual income growth rate prior to merger completion, was used to capture potential of income generation of a target industry. The third variable ROAAVG represented three-year average of return on assets (ROA) prior to merger completion, and served to capture the profitability of a target industry. ROA is commonly used as a key measure of management productivity, an indicator of how efficiently a company's assets are being utilized (Sobel, 1993). To the extent that merger and acquisition is transaction of corporate assets, the potential return on assets would be a key indicator of market attractiveness for the acquiring firm.

Acquirer-target relatedness

This study focused on three aspects of relationship between the industry of the acquiring firm and the target industry: customer relatedness, vertical relatedness, and technological relatedness.

Customer relatedness. First, customer relatedness (CUSTOME) was defined as the degree to which the products/services provided by the acquiring industry are functionally similar or complementary to those provided by a certain target sector. For example, cable television and broadcast television both have the same customer source (i.e., audiences as well as advertisers). However, it should be noted that advertising revenue is the major income source for broadcasters, whereas subscription fee is the major income source for cable systems. Video production studios were also considered to have the same customer base as cable systems. Likewise, plain old telephone and cellular phones are functionally similar and complementary to each other. This study used a dummy variable to measure customer relatedness.

The measurement of customer relatedness was based on common observation. The product provided by conventional cable television system is video delivery services, whereas the product of telephone companies is voice transmission services. Based on this rule of thumb, target sectors such as broadcast television and other video markets were considered related to the cable television industry. Alternatively, voice transmission services such as wireless telephony (e.g., paging and cellular) had a high degree of similarity from consumers' viewpoint. Other sectors were treated as unrelated.

Vertical relatedness. Second, the vertical relatedness was defined as the conventional sell-buyer relationship. This variable was divided into two sub-units: forward integration (FORWARD) and backward (BACKWAR) integration. The construction of relatedness index was based the input-output accounts compiled by the Department of Commerce (DOC, 1998).

The input-output accounts provide very useful data in dollar term of (1) input that a certain industry requires from other industries for its production to final users and (2) output that an industry makes for other industries' output. The index reflects the degree of "resource dependency" between the acquiring and target firms (Klavans, 1990). For the present study, the former index represented the degree of backward vertical relatedness; the latter represented the forward vertical relatedness.

Note that the utilized data (i.e., "industry-by-commodity total requirements coefficients") provide only the indices for the 15 largest producing industries for each industry's production. The remaining is categorized as "all others." However, for a majority of industries, the top 15 industries commonly account for over 80% of the total input required by an industry for its production. The missing data should not cause considerable biases. The value zero was given for those missing data.

Technological relatedness. The third index was defined as the degree of relatedness between two industries in terms of the primary technology for goods or services production. The technological relatedness (SICSIM) index was adopted from the SIC-based "concentric index" developed by Caves, Porter, Spence, and Scott (1980, Chapter 8). This concept was also used by other studies on corporate diversification (Bergh, 1998; Palepu, 1985; Robin & Wiersema, 1995). Based on this concept, the more similar the SIC codes of the acquiring and target industries, the more related they are.

Impact of prior mergers on subsequent ones

According to the isomorphism theory discussed earlier, a firm tends to follow what the other companies with similar characteristics are doing. To test the theory, this study uses two variables to represent the behavior of other acquiring firms within the same core industry—that is, the total number (CUMNUMB) and amount of transaction value (CUMNUMB) of mergers and acquisitions in each target sector that have been completed in the past three years by companies within the same industry (i.e., by cable systems or by telephone companies).

It is worth noting that we expected number of transactions to be a better indicator of merger/acquisition momentum than value of transactions for two reasons. First, the magnitude of transaction value is likely to be affected by some large-scale transactions. In this situation, the trading activity might be overestimated. On the other hand, the use of transaction number can factor out the influence of some large-scale deals. It can better capture the general merger momentum because some smaller-size companies could also be active in business combination though the trading level in dollar term might be small.

Research Design and Variable Validity

To ensure the validity of the results generated from this study, variable validity must be checked. Because the variables such as revenue and market growth have face validity and reliability, the issue of construct invalidity should not arise.

However, a major concern may arise with the validity of the indexing schemes developed to represent the degree of acquirer-target relatedness in this study. As mentioned earlier, the degree of customer relatedness was based on the observation of functional similarity and complementarity of products/services. Although there is no standard criterion for the measurement of relatedness, the definition was considered as consistent with previous studies on the adoption of new media/communications technologies (Atkin, Jeffres, & Neuendorf, 1998; Dupagne, 1999; Jeffres & Atkin, 1996; Perse & Dunn, 1998). That is, consumers tend to adopt those new media/communications technologies that provide utilities similar to those of the existing ones they are using. Because consumer utilities and needs are important concepts in marketing and management disciplines, product similarity should serve as an important indicator of relatedness for managers. Thus, the construction of index of customer relatedness based on observation of product similarity was believed to have face validity.

In addition, operational definitions of several variables in this study were based on the U.S. SIC system—for example, the classification of industrial sectors, the classification as diversification or horizontal expansion, and the degree of technological relatedness. The SIC system was developed to facilitate collection of data for economic analysis. It employs a set of reporting standards that have evolved over time based on a variety of considerations ranging from similarities in materials to product-market linkages. Some scholars have challenged the validity of using SIC to reflect the interrelationship among industries and attempted to develop alternative methods for that matter (Rumelt, 1982; Robins & Wiersema, 1995; Teece, 1982). Although the use of the SIC system provides only limited information on relationships among industries, it has some attractive features that makes its use popular in industry analysis (Hoskisson, Hitt, Johnson, & Moesel, 1993). Because the data are classified according to standard categories, they have the merit of consistency, which helps to make research replicable and cumulative. This is especially important for longitudinal studies. Moreover, it allows researchers to use the broad range of data that are reported using the SIC system. Under these circumstances, the SIC system still serves as a useful basis for this study.

Statistical Procedures

Two statistical methods were used to test the hypotheses. Logistic regression (logit) was performed to test hypotheses 1a through 1d because the dependent variables were qualitative ones and had only two outcomes (i.e., diversification or horizontal expansion; international or domestic merger). Moreover, logistic regression does not face strict statistical assumption such as normality and equal variance, making its application appropriate in many more situations (Hair, Anderson, Tatham, & Black, 1998, p. 276). Like linear regression, logistic regression has straightforward statistical tests and a wide range of diagnostics.

For hypotheses two, three, and four, analysis of covariance (ANCOVA) was performed. Similar to regression, ANCOVA procedure provides straightforward statistical tests and a wide range of diagnostics. But this procedure is appropriate when the dependent variables are quantitative ones, and when the independent variables consist of qualitative and quantitative ones (Agresti & Finlay, 1997, chapter 13). The flexibility of ANCOVA allows us to accommodate the categorical variables such as time period and industrial categories (i.e., cable and telephone).

Hypotheses 1a through 1d

Hypotheses 1a through 1d stated that cable systems and telephone companies were more likely to pursue diversifying mergers/acquisitions and international expansion in the 1990s than the 1980s. In addition, companies faced with slower revenue or net income growth were more likely to make diversifying acquisitions and internationalization.

The binary dependent variable was defined as whether the merger transaction was a diversifying (= 1) or non-diversifying (= 0) one, or whether the merger transaction was a domestic (= 0) or international (= 1) one. The independent variables included ACQUIRE (core business of acquiring firms), PERIOD1 and PERIOD2 (three different time periods), INCOG (three-year net income growth rate of acquiring firms), and SALEG (three-year revenue growth rate of acquiring firms).

The model consisting of only dummy variables ACQUIRE, PERIOD1, and PERIOD2 was tested first, and served as a baseline model. Then the model with the addition of quantitative independent variables SALEG and INCOG was tested for comparison. This procedure allowed us to examine the improvement of explanatory power of the independent variables INCOG and SALEG.

Hypotheses 2a and 2b

Hypotheses 2a and 2b stated that cable and telephone companies pursuing diversification were more likely to acquire target firms in the industries with higher growth rate and profitability. To test these hypotheses, ANCOVA was performed.

The methodology followed that used by Klavans (1990) and Pfeffer and Salancik (1978). The dependent variable was the ratio of the number of transactions (and total value of transactions) of mergers/acquisitions cable or telephone companies made into individual industries within a single year to the total mergers completed by cable or telephone companies within the same year. To a large extent, the percentage based on transaction value represented the degree of resource allocation (i.e., capital investment) by the cable and telephone industries for diversifying mergers in each of the non-core industrial sectors. The percentage based on transaction number represented the occurrence of merger/acquisition in a certain target industry. Total number (transaction number ratio) and total value (transaction value ratio) were tested separately. The independent variables were ACQUIRE, PERIOD1, PERIOD2, SALEGRO (revenue growth rate), NETGROA (income growth rate), and ROAAVG (profitability).

Similar to the previous logit procedure, the model consisting of only dummies ACQUIRE, PERIOD1, and PERIOD2 was tested first and served as a baseline model. This procedure allowed us to examine the degree of variation accounted for by SALEGRO, NETGROA, and ROAAVG.

Hypotheses 3a through 3c

Hypotheses 3a through 3c stated that cable and telephone companies pursuing diversification were more likely to acquire firms in core-related industries. The same ANCOVA procedure was performed to test these hypotheses. The same dependent variables (i.e., transaction number ratio and transaction value ratio) were tested separately. Independent variables included ACQUIRE, PERIOD1, PERIOD2, CUSTOME (customer relatedness), FORWARD (forward relatedness), BACKWAR (backward relatedness), and SICSIM (technological relatedness). Similarly, the based line model with only dummy variables was tested first. The expanded model with other interval variables was then tested for comparison purposes.

Hypothesis four

Hypothesis four stated that cable and telephone companies pursuing diversification were more likely to follow the same patterns of acquisitions that had been previously repeated by other acquiring firms within the same industry. To test this hypothesis, the same statistical procedure was performed, and the same dependent variables were tested separately. Independent variables were ACQUIRE, PERIOD1, PERIOD2, CUMVALU (three-year cumulative transaction value) and CUMNUMB (three-year cumulative transaction number). The baseline model versus expanded model procedure was performed for comparison purposes.

CHAPTER 4
RESULTS

Population Description

The present study is based on census data. The database search for all mergers/acquisitions (M&A) completed by U.S.-based telephone and cable companies from 1984 through 1999 yielded 1782 transaction, valuing approximately $500 billion. Because a large number of deal values were not available, the total amount of trading was considerably underestimated. Telephone companies completed 1085 merger deals during this period of time, accounting for about 61% of all data collected; cable systems completed 697 mergers/acquisitions (39%). In dollar term, the total value of mergers completed by telephone companies reached nearly $374 billion, accounting for about 75% of all data collected. Value of mergers concluded by cable systems totaled about $126 billion, accounting for about 25%.

General M&A Trend in Cable and Telephone Industries

Figure 4-1 shows the M&A trend 1984 through 1999. In general, the trading level continued to rise throughout the period, with most obvious increases in the second half of the 1990s. In terms of number of transactions, trading activity of the telephone industry started to increase substantially in the late 1980s, and the rising trend became even more obvious in the second half of the 1990s. By contrast, cable systems concluded slightly more mergers/acquisitions than telephone companies in the late 1980s, reaching its highest level in 1988. But the momentum started to lose steam in the early 1990s and was surpassed by telephone companies since 1989. Moreover, the gap of trading level between telephone and cable companies had continued to broaden. Most obviously, trading level in the telephone industry took off in 1997, reaching in 1999 the highest level of 195 transactions.

The merger trend, however, demonstrates a substantially different pattern when viewed in dollar term. As shown by the flat curve, the trading level by both telephone companies and cable systems had remained generally small and flat until 1990. Both industries had not differed much in terms of total transaction value. However, the gap started to widen first slightly in the early 1990s and then dramatically after 1997. In just two years from 1997 to 1999, the dollar value of mergers/acquisitions by telephone companies surpassed that by cable systems by several times. Data show that the telephone industry spent more than $157 billion in mergers/acquisitions in 1999 alone. This compares to the $85.6 billion by the cable industry.

Table 4-1 compares changes of average value per transaction over time in the cable and telephone industries. The trend demonstrates that average transaction value in the 1980s generally remained at the low level in both industries. With a few exceptions, the average value per transaction was less than $100 million. With respect to telephone companies, average transaction value started to rise steadily in the first half of the 1990s, and increased most substantially after 1997. The average value was about $200 million in 1997, but surged quickly to more than $800 million per transaction in 1999. A major reason for this drastic increase is the few quite large-scale mergers completed by the Bell companies and AT&T.

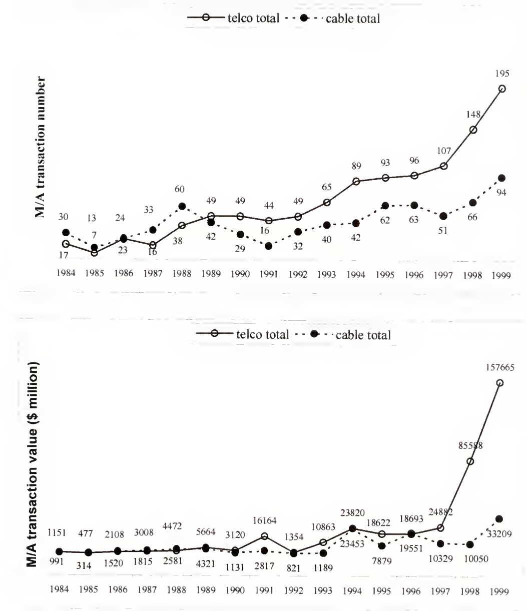

Figure 4-1. Trend of merger/acquisition, 1984-1999. a) Trading level by transaction number. b) Trading level by transaction value.

With respect to cable systems, the average transaction value actually dropped to the lowest level in the early 1990s, but picked up quickly after 1994. The average value remained around $200 million in the second half of the 1990s. Generally speaking, except for the 1980s, the average transaction in the telephone industry was higher than that in the cable industry.

Table 4-1. Comparison of average value per transaction ($ million).

year	General pattern		Horizontal pattern		Diversification pattern		Domestic pattern		International pattern	
	telco	cable	telco	cable	telco	cable	telco	cable	telco	cable
1984	68	33	82	59	20	13	68	33		
1985	45	37	51	24	43	185	45	40		
1986	66	88	24	52	78	268	65	88	90	
1987	113	91	0	99	151	45	114	91	109	
1988	68	75	67	78	68	56	74	75	13	
1989	116	103	66	125	168	8	104	107	176	26
1990	64	39	70	36	56	53	65	41	17	22
1991	367	176	327	142	408	220	400	185	109	36
1992	28	26	31	35	24	11	32	28	3	4
1993	167	30	59	23	259	34	219	35	22	14
1994	268	558	39	200	409	1357	257	634	365	1
1995	200	127	191	161	206	19	196	139	218	47
1996	195	310	457	395	70	81	224	344	67	77
1997	233	203	429	241	67	142	259	211	42	104
1998	578	152	1422	198	65	46	653	131	244	273
1999	809	353	1265	452	575	170	1059	363	136	277

To sum up, the increasing number and value of transactions demonstrate that both cable systems and telephone companies were active in pursuing mergers and acquisition in the 1990s, especially in the second half of the decade. Average value per transaction also rose steadily in the 1990s, and increase most substantially in the 1996-1999 period. The pattern is most obvious in the telephone industry.

It should be noted that the M&A patterns based on transaction value must be viewed with caution for two reasons. First, a large number of transactions did not report the values. Thus, observations based on transaction value might not accurately reflect the real situation as opposed to observations based on the number of transactions. Second, as revealed by the considerable fluctuations in the previous figures, the trend based on transaction value was sensitive to some large-scale mergers or acquisitions. In some cases, the impact of large-scale transactions tended to skew the pattern so much that the patterns were inconsistent with those based on the number of transactions. Therefore, we would suggest that the patterns and trends based on transaction number would more truly reflect the merger/acquisition activities in the cable and telephone industries.

Horizontal Expansion versus Diversification

Figure 4-2 distinguishes diversifying mergers from horizontal expansions by the telephone and cable industries, respectively. Overall, the number of horizontal mergers by cable systems was larger than that by telephone companies in the 1980s, especially in the later 1980s. The difference started to diminish quickly, however, after 1998 when horizontal expansion by the cable industry dropped continuously and horizontal expansion by the telephone industry started to rise. Thereafter, horizontal expansion by both industries had remained generally at the same level.

Cable companies' focus on horizontal expansion also means that the telephony industry was more likely to pursue diversifying mergers/acquisitions than the cable industry. Throughout the period 1984-1999, the number of diversifying mergers completed by telephone companies had remained larger than that by cable systems. The gap was widest in the second half of the 1990s. During this period, the trading level of the telephone industry surged dramatically. At the same time, the level of diversifying mergers/acquisitions by the cable industry started to drop from the slight increase in the early 1990s.

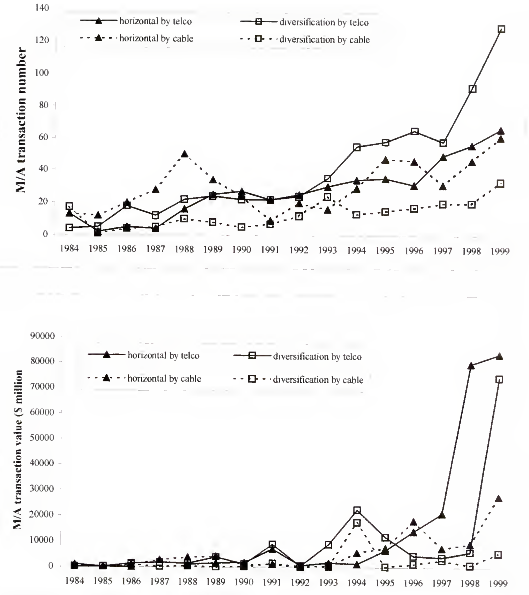

Figure 4-2. Trend of diversification, 1984-1999. a) Trading level by transaction number. b) Trading level by transaction value.

The merger trend in terms of transaction value exhibits a different pattern. In general, the difference between horizontal expansion and diversification was quite small in the 1980s as opposed to the trend in terms of transaction number. This implies that the amount of capital investment in horizontal mergers was smaller than the amount of investment in diversification. Specifically, the number of horizontal mergers by the cable industry was very large, but the transaction value was relatively small. A major reason for this discrepancy might be the common practice of system swaps in the cable industry. In this situation, no transaction value was involved.

But the pattern started to change in the mid-1990s. The telephone industry seemed to be more enthusiastic in diversification than the cable industry in terms of transaction value in the early 1990s. The trading level of diversifying mergers, however, was quickly surpassed by horizontal expansion after 1996. The momentum of horizontal expansion in dollar term in the telephone industry reached the historical high in the second half of the 1990s. By contrast, cable companies tended to focus on horizontal expansion. There was only a brief increase of diversification from 1993 to 1995.

Interestingly, as shown by the two peaks, the amount of transaction value in horizontal integration by the telephone industry jumped drastically in 1998 and 1999. The transaction value of diversifying mergers by the telephone industry also surged dramatically in 1999. The dramatic increase in both diversification and horizontal expansion in the telephone industry can be attributed to several large-scale deals such as the purchase of TCI and MediaOne by AT&T, the merger between Bell Atlantic and NYNEX, and the acquisition of MCI by WorldCom.

With respect to average value per transaction, telephone companies tended to invest largest amount of capital in diversification in the late 1980s and particularly in the 1990-1995 period (Table 4-1). The value per diversifying merger was around $200 million on average, and in a couple of cases even reached more than $400 million.

Interestingly, the focus shifted drastically to horizontal expansion after 1996. Data show that the average value per horizontal merger/acquisition surged to more than $450 million in 1996 from the $190 million level in 1995. Pumped by several large-scale business combinations between Bell companies, the average value continue to increase dramatically, reaching more than $1,000 million in 1998 and 1999.

In contrast to telephone companies, cable systems did not show a consistent pattern in diversification. In most cases, average value per transaction remained considerably small as opposed to telephone companies. It is worth noting that the average value per diversifying transaction peaked in 1994 ($1357 million). A check of the data reveals that this peak was mainly a result of Viacom's purchases of Paramount Communications ($9600 million) and Blockbuster Entertainment ($7971 million).

In general, cable systems tended to invest more capital in horizontal expansion. Average value per transaction was mostly higher than diversifying ones. The average value started to increase quickly after 1994, reaching the highest level in the 1996-1999 period.

The trend of diversification is most apparent when viewed on a percentage basis. The use of percentage (i.e., the ratio of total diversifying mergers to the total mergers by the telephone and cable industries, respectively) allows us to compare the merger/acquisition momentum of the two industries more properly because of the different number of firms and trading level in the telephone and cable industries. With respect to telephone companies, diversifying mergers in terms of transaction number accounted for nearly 60% in the 1980s. By contrast, diversifying mergers by the cable systems accounted for no more than 20% most of the time during the same period (Figure

4-3). In other words, 80% or so of all the mergers/acquisition completed by the cable industry were intended for horizontal expansion, whereas 40% of mergers by the telephone industry were of this category.

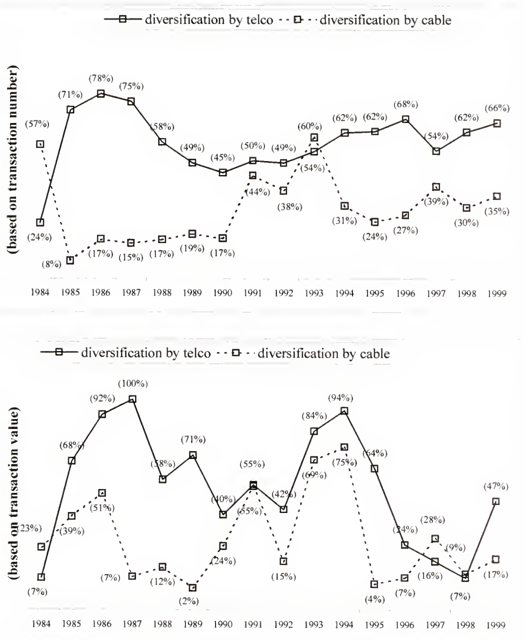

Figure 4-3. Trend of diversification in percentage format, 1984-1999. a) Percentage based on transaction number. b) Percentage based on transaction value.

The diversification trend began to change in the end of the 1980s. The percentage of diversification by the telephone industry started to drop gradually and nearly remained at the same level of horizontal expansion. Although the percentage of diversifying mergers started to increase again in the second half of 1990s, it had not returned to same proportion in the 1980s. Diversification pattern of the cable industry also underwent dramatic changes. Figure 4-3 shows that cable systems were most enthusiastic about diversification in the early 1990s, but shifted back to horizontal expansion as the major merger strategy in the second half of the decade.

Figure 4-3 also exhibits the diversification trend from a different viewpoint (part b). Based on percentage derived from transaction value, the diversification trend largely paralleled the trend based on percentage of transaction number in the 1980s and early 1990s, though with a considerable degree of fluctuation. With respect to the telephone industry, the momentum of diversification surged drastically immediately after 1984 and reached 100% in 1988. The momentum of diversifying mergers/acquisitions dwindled substantially during 1990-1992, but returned quickly to a new peak in 1993 (84%) and 1994 (94%). Most interesting is the drastic drop of diversification right before 1996, the year in which the new Telecommunications Act was signed into law. This suggests that the telephone industry invested an enormous proportion of capital in horizontal expansion in the second half of the 1990s. This pattern was not accurately captured by the diversification pattern based on transaction number percentage.

With respect to the cable industry, the diversification trend showed a similar pattern, whether it was based on transaction number ratio or transaction value ratio (Figure 4-3). That is, except for the few years in the first half of the 1990s, cable systems had been constantly pursuing horizontal expansion throughout the period 1984-1999. The shift to diversification in the early 1990s might be a response to the amendment of the cable regulations (i.e., the 1992 Cable Act), which was believed to reinstitute stricter regulations on the cable industry such as price control and ownership restrictions.

In summary, horizontal expansion continued to be the major M&A strategy in the cable industry. The drop of trading activities in the early 1990s might be a response to re-regulation of the 1992 Cable Act. The M&A activities in the telephone industry demonstrates a more complex pattern. Diversification was the major M&A strategy in the 1980s. The momentum of horizontal expansion started to gain steam in the early 1990s, but enthusiasm about diversification returned in the mid-1990s (i.e., 1993-1995). Most interesting is the drastic shift to horizontal combination among Bell companies after 1996. In terms of total transaction value, around 70% of transactions completed by telephone companies were horizontal mergers in the second half of the 1990s.

International Merger/Acquisition

Figure 4-4 shows that the telephone industry started to pursue international expansion earlier than the cable industry. Moreover, there were more international mergers by telephone companies than by cable systems. The telephone industry started to acquire overseas companies in the second half of the 1980s, while the international expansion of the cable industry only began at the turn of the decade. Generally speaking, internationalization through mergers/acquisitions was relatively rare in the 1980s. The trend of internationalization was more obvious in the 1990s. Based on the amount of transaction value (Figure 4-4, part b), however, the trading level of the telephone industry did not differ considerably from that of the cable industry until 1997, whereby the gap started to broaden dramatically.

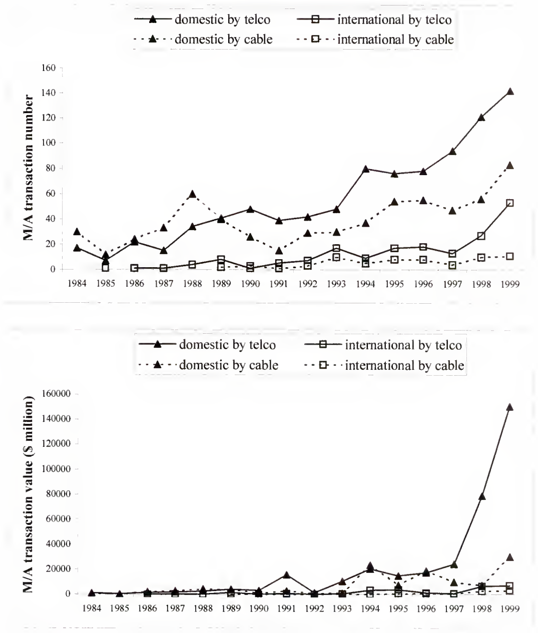

Figure 4-4. Trend of international expansion, 1984-1999. a) Trading level by transaction number. b) Trading level by transaction value.

The increasing gap suggests that telephone companies started to pay more attention to international expansion after 1997. In addition to privatization and liberalization of global markets, a possible reason for this considerable increase in the number of international mergers/acquisitions by telephone companies might be attributed to the recent reciprocity agreement of "settlement" fees in global telecommunications.

Figure 4-5 exhibits the internationalization trend based on percentage derived from the number and value of transactions, respectively. Likewise, the trend based on transaction number percentage shows that both the telephone and cable industries were more likely to pursue international expansion in the 1990s than 1980s. However, the slightly flatter trend based on transaction value percentage suggests that the proportion of capital channeled into international mergers had remained considerably small. Except for some small-scale peaks, the percentages were smaller than 10%. This compares to the above 10% level based on transaction number percentage (Figure 4-5, part a). Moreover, there was no distinct difference between the telephone and cable industries. All in all, this suggests that while international markets had become important opportunities for market expansion, both telephone and cable companies were still considerably cautious about entry into foreign markets.

Data show that in most cases, average value of international mergers by U.S. telephone companies tended to be lower than domestic ones (Table 4-1). Although there were some cases in which the average transaction value seemed quite high, these were mostly due to one or two larger mergers in the year.

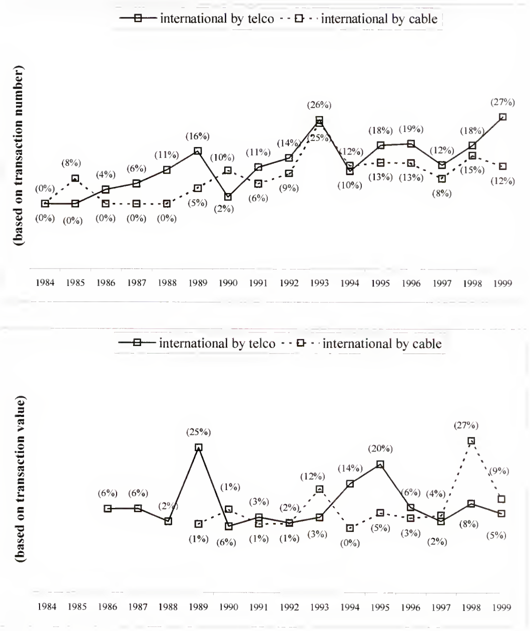

Figure 4-5. Trend of international expansion in percentage format, 1984-1999. a) Percentage based on transaction number. b) Percentage based on transaction value.

For example, Southwestern Bell spent more than $2600 million for the purchase of Societe Fracaise, a French telecom service provider, in 1994. Ameritech purchased about 34% of ownership of TeleDanmark (in Denmark) for nearly $3200 million in 1998.

Likewise, average value of international mergers by U.S. cable companies tended to be quite small as opposed to domestic ones. The two peaks in 1998 and 1999 were attributed mainly to a couple of larger-scale transactions. For example, the U.S. NTL Inc. spent about $2600 million in purchases of two cable systems in Britain and Ireland.

In conclusion, both telephone and cable companies were more active in pursuing international expansion in the 1990s. Telephone companies tended to be more enthusiastic about global markets, and began international expansion earlier than the cable industry. However, most international mergers were quite small in dollar term.

Hypothesis Tests

This section reports the results of hypothesis tests. All variables were checked for statistical assumptions and subjected to transformation, if necessary, before subjected to statistical procedures. Because the variables used different measurement units, they were further standardized, using z-score. This procedure would standardize the coefficients of the independent variables and make it possible to compare the impact of each independent variable.

All standardized independent variables were then checked for correlation. The corporate-level independent variables INCOG (three-year corporate income growth rate) and SALEG (three-year revenue growth rate) were found moderately correlated ($r = .62$, $p < .01$). Most of the industry-level independent variables did not have substantial correlation (Table 4-2). Nevertheless, it is worth noting that forward relatedness (FORWARD) and backward relatedness (BACKWAR) had a perfect correlation ($r = 1.00$), a statistical problem referred to as singularity. This is a natural outcome because backward relatedness and forward relatedness are in a mutual relationship. Both these two variables were also found highly correlated with technological relatedness (SICSIM, r = .70, p < .01), and moderately correlated with customer relatedness (CUSTOME, r = .62, p < .01). The variables CUMVALU (three-year cumulative deal number) and CUMNUMB (three-year cumulative transaction value) were also closely correlated (r = .78, p < .01). Accordingly, special care must be taken in result interpretation. The problem of multicollinearity was addressed in the following sections separately.

Table 4-2. Correlation of independent variables.

Variables	1	2	3	4	5	6	7	8
1. SALEGRO	---							
2. NETGROA	.24**	---						
3. ROAAVG	-.03	-.14**	---					
4. BACKWAR	.00	.02	-.13**	---				
5. FORWARD	.00	.02	-.13**	1.00**	---			
6. SICSIM	-.03	.07	-.34**	.70**	.70**	---		
7. CUSTOME	.01	.22**	-.23**	.62**	.62**	.50**	---	
8. CUMVALU	.02	.01	-.08	.38**	.38**	.43**	.23**	---
9. CUMNUMB	.03	.04	-.09	.45**	.45**	.55**	.36**	.78**

* Significant at the .05 level.
** Significant at the .01 level.

Likelihood to Pursue Diversification

Hypothesis 1a stated that cable and telephone companies were more likely to adopt diversifying merger/acquisition strategies in the 1990s than in the 1980s. Logistic regression (logit) was performed to test this hypothesis. The unit of analysis is the individual merger deal. Because this study used census data, inferential statistics (such as Wald score and p-value) are indicated only for reference purposes, but are not discussed.

Parameter estimates of the independent variables (i.e., coefficients) are the major concerns for the present study.

As Table 4-3 indicates, the sub-period 1984-1989 (PERIOD1) has a coefficient B = -.26; the sub-period 1990-1995 (PERIOD2) has a coefficient B = -.31. This implies that cable and telephone companies were least likely to pursue diversification in the first half of the 1990s, and most likely in the second half of the 1990s. Thus, hypothesis 1a was partially supported. The period 1984-1989 had a higher level of diversification than the 1990-1995 period probably because the high diversification level of the telephone industry was considerably cancelled out by the very low level of diversification in the cable industry. Otherwise, the results are generally in accordance with the findings presented in the previous population description.

The results also demonstrate that, in general, cable systems were less likely than telephone companies to pursue diversification (B = -1.25). However, as revealed by the positive coefficients of the two interaction terms ACQUIRE *PERIOD1 (B = -.27) and ACQUIRE * PERIOD2 (B = .38), there is strong evidence that cable systems were most likely to pursue horizontal expansion in the 1980s, but were most likely to pursue diversification in the 1990s, especially in the first half of the decade. By contrast, telephone companies were most likely to pursue diversification in the 1980s and least likely in the first half of the 1990s.

Hypothesis 1b stated that cable and telephone companies faced with slower business or income growth were more likely to pursue diversification. Two variables were used to represent business status. One was the three-year average of net income growth rate of the acquiring firm prior to the year of deal completion (INCOG); the other was the three-year sales growth rate of the acquiring firm prior to the year of deal completion (SALEG). The two variables were checked for normality; the normality test rejected the null hypothesis that the distribution was normal. However, because logit procedure is based on maximum likelihood model and is robust against non-normal distribution, no transformation was performed.

Table 4-3 shows that the variable of income growth had a positive impact on the likelihood of pursuing diversification (B = .12). By contrast, sales growth had a negative impact (B = -2.77), but the impact was greater than that of income growth. The results suggest that companies confronted with lower sales growth rate were more likely to pursue diversification; but companies with higher income growth were more likely to adopt diversifying merger strategies. In addition, sales growth played a more influential role than corporate income growth in the diversification decision. Thus, hypothesis 1b was partially supported.

Table 4-3 also reveals that the inclusion of the variables of sales growth and income growth into the model provides a higher explanatory power than the use of only dummy variables in the baseline model. The inclusion of sales and income variables increases the R square by more than 10% (Cox & Snell R square = .19, Nagelkerke R square = .26, Chi-square = 11.34, p = .18).

The results, nevertheless, must be viewed with caution because of some technical problems of the data. One problem is the considerable correlation between the two independent variables INCOG and SALEG (r = .62, p < .01). To check the possible distortion caused by multicollinearity, the two variables were tested separately. Table 4-4 reports the results. When the two variables were tested separately, both had negative impact. That is, companies with slower income growth or slower sales growth were more likely to pursue diversification. However, the explanatory power as demonstrated by the R square value was lower than when both variables were included in the analysis. Chi-square results also did not show much improvement as opposed to the baseline model. Moreover, the variable SALEG (B = -.12) had a greater impact than INCOG (B = -.05). Thus, hypothesis 1b generally still hold.

Table 4-3. Logit results of hypothesis 1a and 1b (diversification).

Variable	H1a (baseline model)		H1b (financial data included)	
	N = 1782 df = 1		N = 481 df = 1	
	Coefficient	Wald	Coefficient	Wald
Intercept	.53**	35.64	-2.18*	5.37
ACQUIRE (cable = 1)	-1.25**	63.45	.48	.21
PERIOD1 (1984-1989 = 1)	-.26	1.95	-1.80*	4.20
PERIOD2 (1990-1995 = 1)	-.31*	5.17	1.03	1.97
ACQUIRE * PERIOD1	-.27	.93	-1.89	1.62
ACQUIRE * PERIOD2	.38	2.59	8.12	.06
INCOG			.12	.20
SALEG			-2.77	2.31
-2 log likelihood	2304.08		76.95	
Cox & Snell R square	.09		.19	
Nagelkerke R square	.12		.26	
Chi-squire			11.34	
df			8	
P value			.18	

* Significant at the .05 level
** Significant at the .01 level

In addition to multicollinearity, the analysis has another problem. A large amount of corporate financial data was unavailable (about more than 80% of all observations). There is possibility that those companies with missing financial data might show a different pattern. Whether the missing data would generate any serious systematic bias was, however, difficult to assess.

Likelihood to Pursue International Expansion

Hypothesis 1c stated that cable and telephone companies were more likely to pursue international expansion via mergers/acquisitions in the 1990s. The same logit procedure was performed to test this hypothesis, following the same steps and using the same independent variables as the previous section.

The baseline model (Table 4-5) with only dummy variables shows that telephone companies were in general more likely to pursue international expansion than cable systems (B = -.61). As demonstrated by the coefficients of the two dummies for periods 1984-1989 (PPERIOD1, B = 1.90) and 1990-1995 (PERIOD2, B = -.41), companies were least likely to acquire or merge with foreign firms in the 1980s and most likely in the second half of the 1990s. Hypothesis 1c was supported.

The interaction terms (ACQUIRE * PERIOD1 and ACQUIRE * PERIOD2) reveals that cable systems were least likely to pursue international expansion in the 1980s, and most likely in the first half of the 1990s (i.e., 1990-1995). Likewise, telephone companies were least likely to pursue international mergers/acquisitions in the 1980s. But unlike cable systems, telephone companies were most likely to pursue international expansion in the second half of the 1990s (i.e., 1996-1999).

Table 4-4. Logit results of hypothesis 1b with variables tested separately (diversification).

Variable	INCOG in the model		SALEG in the model	
	N = 481 df = 1		N = 534 df = 1	
	Coefficient	Wald	Coefficient	Wald
Intercept	-.91	3.55	.10	.14
ACQUIRE (cable = 1)	.22	.07	-1.60**	5.31
PERIOD1 (1984-1989 = 1)	1.06	2.05	.49	.76
PERIOD2 (1990-1995 = 1)	.51	.71	.32	.55
ACQUIRE * PERIOD1	-1.29	.96	-.01	.00
ACQUIRE * PERIOD2	1.01	.75	1.55	2.73
INCOG	-.05	.05		
SALEG			-.12*	.36
-2 log likelihood	115.45		200.62	
Cox & Snell R square	.07		.09	
Nagelkerke R square	.09		.12	
Chi-squire	3.74		8.75	
df	8		8	
P value	.88		.36	

* Significant at the .05 level
** Significant at the .01 level

Hypothesis 1d stated that cable and telephone companies faced with slower revenue and income growth would be more likely to pursue international expansion. Table 4-5 shows that the inclusion of the variables of three-year sales growth rate and income growth rate of the acquiring firm into the model substantially increases the overall explanatory power (Cox & Snell R square = .18, Nagelkerke R square = .34, Chi-square = 12.83, p = .076). The coefficients of the two variables illustrate that firms with higher income growth were more likely to pursue internationalization (B = .60). By contrast, firms with lower sales growth rates were more likely to acquire or merge with foreign companies (B = -10.32). In addition, sales growth had a larger impact than income growth. Thus, hypothesis 1d was partially supported. Notwithstanding, it is necessary to take the results with caution because of the large amount of missing data.

Table 4-5. Logit results of hypothesis 1c and 1d (international expansion).

Variable	H1c (baseline model)		H1d (financial data included)	
	N = 1781 df = 1		N = 481 df = 1	
	Coefficient	Wald	Coefficient	Wald
Intercept	-1.38**	165.96	-6.52*	5.83
ACQUIRE (cable = 1)	-.61**	8.21	-7.02	.01
PERIOD1 (1984-1989 = 1)	-.90**	8.96	1.02	.73
PERIOD2 (1990-1995 = 1)	-.41*	5.16	1.05	1.14
ACQUIRE * PERIOD1	-1.30*	3.68	-1.3	.00
ACQUIRE * PERIOD2	.55	2.82	-1.60	.00
INCOG			.60	1.74
SALEG			-10.32*	3.65
-2 log likelihood	1370.17		39.26	
Cox & Snell R square	.03		.18	
Nagelkerke R square	.06		.34	
Chi-squire			12.83	
df			7	
P value			.076	

* Significant at the .05 level
** Significant at the .01 level

To check whether the problem of multicollinearity would generate some bias in the analysis, the independent variables of income growth and sales growth were tested separately. Table 4-6 demonstrates that the variable INCOG (B = .12) still had a positive impact on the likelihood of international expansion, and SALEG (B = -.99) still had a negative impact. The results, thus, still partially supported hypothesis 1d. It should be noted that the explanatory power of the model based on both income and sales growth is much higher than the models using only income growth or sales growth separately.

Factors Affecting Selection of Diversification Target Industries

Results of the previous hypothesis testing demonstrate that, in addition to changes in the regulatory environment, status of core business of the acquiring firms in terms of revenue growth and net income growth also played a critical role in a company's decision to pursue diversification and international expansion. One might subsequently ask that, once a company decided to pursue diversifying mergers/acquisitions, what were the factors that might influence the selection of a new market to enter. The following section examines this issue.

Unlike the previous hypothesis testing, whose unit of analysis is the individual transaction, the unit of analysis for the following hypotheses is the overall merger/acquisition pattern at the industry level. The dependent variables are the ratios of total mergers—based on number and value of transactions, respectively—in a specific target industry completed by the cable or telephone industries. Because the focus was on diversification in this section, horizontal mergers were not included in the data. The pooled data resulted in 395 observations when the dependent variable was based on transaction number ratio, and 256 observations when the dependent variable was based on transaction value ratio.

Table 4-6. Logit results of hypothesis 1d with variables tested separately (international expansion).

Variable	INCOG in the model		SALEG in the model	
	N = 481 df = 1		N = 534 df = 1	
	Coefficient	Wald	Coefficient	Wald
Intercept	-2.27**	9.25	-2.71**	23.65
ACQUIRE (cable = 1)	-7.9	.02	-.13	.01
PERIOD1 (1984-1989 = 1)	.59	.30	.48	.27
PERIOD2 (1990-1995 = 1)	1.06	1.51	1.02	2.28
ACQUIRE * PERIOD1	-.56	.00	-7.17	.06
ACQUIRE * PERIOD2	-1.01	.00	-1.14	.50
INCOG	.12	.23		
SALEG			-.99	1.42
-2 log likelihood	56.76		89.91	
Cox & Snell R square	.11		.05	
Nagelkerke R square	.20		.12	
Chi-squire	2.61		6.56	
df	8		8	
P value	.96		.58	

* Significant at the .05 level
** Significant at the .01 level

Prior to hypothesis testing, each variable was checked for normality, and, when possible, transformed if the assumption of normal distribution was violated. In order to render the coefficients of individual variables comparable, all the variables were standardized using z-score because they had different measurement units. In addition, because the value of dependent variables—transaction number ratio and transaction value ratio—ranges between zero and one, the variables were further subjected to logistic transformation. Logistic transformation was performed to meet the linearity assumption in ANCOVA procedure.

The baseline model, which consists of only dummy variables ACQUIRE, PERIOD1, and PERIOD2, was first tested. New independent variables were subsequently incorporated into the model. Thus, the dummy variables serve as control variables and allow us to compare the explanatory power of subsequently added variables.

Impact of market attractiveness on selection of diversification targets

The product/market-portfolio model suggests that corporate diversification decision is influenced by the degree of attractiveness of the market in which the target firm is operating. Hypothesis 2a stated that cable and telephone companies were more likely to acquire target firms in markets with higher profitability. The three-year average of rate of return on assets (ROAAVG) of the target industry prior to the completion year was used to represent the degree of profitability. Hypothesis 2b stated that cable and telephone companies were more likely to pursue diversification into markets with higher growth rate. Two variables—three-year sales growth rate (SALEGRO) and profit growth rate (NETGROA) prior to the completion year—were used to represent growth rate of the target industry.

Table 4-7 shows the results of the ANCOVA procedure, with transaction number ratio as the dependent variable. The coefficients of the variables ROAAVG (B = -.11) and SALEGRO (B = -.01) have negative signs. The variable NETGROA has a positive sign (B = .05). The relatively low coefficients indicate that these variables had only slight impact on the selection of diversification targets.

Table 4-8 shows the results of the ANCOVA procedure, with transaction value ratio as the dependent variable. The variable of ROAAVG has a negative impact (B = -.17). Both SALEGRO (B = .03) and NETGROA (B = .03) have positive but very low coefficients.

In both the transaction number ratio and transaction value ratio scenarios, profitability, defined as return on assets, had a slight impact on the selection of diversification targets, but in the opposite direction as hypothesized. Thus, hypotheses 2a was not supported.

The positive signs of NETGROA in both transaction number and transaction value scenarios suggest that cable and telephone companies were more likely to enter markets with higher profit growth rate. On the other hand, the results do not show a consistent pattern with respect to sales growth rate (SALEGRO). Although sales growth rate had a positive impact on the selection of diversification targets in the transaction value ratio scenario, it exhibited a negative impact in the transaction number ratio scenario. Thus hypothesis 2b was only partially supported.

To sum up, results of the hypothesis testing indicate that the degree of market attractiveness did not play a substantial role in cable and telephone companies' selection of diversification targets. In addition, the direction of impact was inconsistent. The low value of adjusted R square (.26 in the case of transaction number ratio and .20 in the case of transaction value ratio) demonstrates that the inclusion of these market-attractiveness variables did not improve the overall explanatory power as opposed to the baseline model.

In other words, the product/market-portfolio model did not provide adequate explanation for the diversification patterns of the cable and telephone industries.

Impact of acquirer-target relatedness on selection of diversification targets

The resource-based view on diversification assumes that a firm seeks to extend its core competence into other markets by acquiring other firms whose primary businesses are related to its own. In a similar vein, the resource dependency theory suggests that vertical relationship plays a critical role in a company's selection of acquisition targets. Based on these conceptualizations, the strategy model on diversification patterns posits that mergers/acquisitions are more likely to occur when the acquiring and target companies are technologically related, share similar customer bases, or are in a vertical relationship.

Hypothesis 3a stated that cable and telephone companies were more likely to pursue diversification in technology-related markets. Hypothesis 3b stated that companies were more likely to acquire target firms in customer-related markets for diversification. Hypothesis 3c stated that companies were more likely to acquire or merge with vertically related targets, either backward or forward. ANCOVA procedure was performed to test these hypotheses. Similar steps as those in the previous hypothesis testing were taken for data transformation and standardization.

Because the four independent variables (FORWARD, BACKWAR, SICSIM, and CUSTOME) were closely correlated to each other (Table 4-2), the inclusion of all the four into hypothesis testing might cause statistical problems due to redundant information.

Table 4-7. ANCOVA results of hypotheses 2-4 (dependent variable based on transaction number ratio).

Variable	Baseline	H 2	H 3(a)	H3(b)	H 4(a)	H4(b)	ALL
	N = 395	N = 367	N = 395	N = 395	N = 347	N = 347	N = 321
Intercept	-.35** (-2.98)	-.32** (-2.65)	-.36** (-3.53)	-.36** (-3.57)	-.33** (-2.88)	-.26** (-2.80)	-.26** (-2.72)
ACQUIRE (telephone = 1)	-.20 (-1.39)	-.16 (-1.08)	-.11 (-.83)	-.10 (-.78)	-.27 (-1.86)	-.49** (-4.20)	-.37** (-3.09)
PERIOD1 (1984-1989 =1)	.77** (3.93)	.58** (2.66)	.51** (2.98)	.50** (2.96)	.86** (4.50)	.74** (4.80)	.46** (2.68)
PERIOD2 (1990-1995 =1)	.90** (5.39)	.85** (4.86)	.80** (5.54)	.80** (5.54)	1.00** (6.01)	.93** (7.05)	.86** (6.28)
ACQUIRE * PERIOD1	.68** (2.83)	.84** (3.20)	.90** (4.29)	.90** (4.30)	.71** (3.01)	1.04** (5.39)	1.19** (5.80)
ACQUIRE * PERIOD2	-.53* (-2.55)	-.57** (-2.67)	-.47** (-2.65)	-.47** (-2.65)	-.53** (-2.60)	-.36* (-2.22)	-.39* (-2.38)
SALEGRO		-.01 (-.31)					.04 (.10)
NETGROA		.05 (1.09)					.02 (.42)
ROAAVG		-.11* (-2.08)					.02 (.45)
FORWARD			-.13* (-1.96)				-.08 (-1.30)
BACKWAR				-.14* (-2.11)			---
SICSIM			.44** (7.91)	.45** (7.99)			.19** (3.09)
CUSTOME			.17** (3.33)	.17** (3.40)			.11* (2.04)
CUMVALU					.37** (8.70)		---
CUMNUMB						.54** (15.20)	.41** (9.24)
R square	.27	.27	.47	.47	.41	.54	.57
Adjusted R square	.26	.26	.46	.46	.40	.54	.56

* Significant at the .05 level.

** Significant at the .01 level.

Note: Numbers in brackets are t-score.

Table 4-8. ANCOVA results of hypotheses 2-4 (dependent variable based on transaction value ratio).

Variable	Baseline	H 2	H 3(a)	H3(b)	H4(a)	H 4(b)	ALL
	N = 256	N = 237	N = 256	N = 256	N = 228	N = 228	N = 210
Intercept	-.10 (-.62)	-.07 (-.41)	-.10 (-.68)	-.10 (-.67)	-.08 (-.49)	-.05 (-.34)	-.04 (-.27)
ACQUIRE (telephone = 1)	-.50** (-2.65)	-.49* (-2.46)	-.48** (-2.63)	-.48** (-2.64)	-.60** (-3.05)	-.78** (-4.31)	-.74** (-3.73)
PERIOD1 (1984-1989 =1)	.59* (2.31)	.60* (1.96)	.41 (1.66)	.41 (1.67)	.59* (2.30)	.58* (2.45)	.58* (1.99)
PERIOD2 (1990-1995 =1)	.40 (1.85)	.29 (1.21)	.29 (1.39)	.29 (1.40)	.51* (2.30)	.40* (1.97)	.34 (1.48)
ACQUIRE * PERIOD1	.67* (2.14)	.69* (1.97)	.85** (2.82)	.85** (2.81)	.84** (2.68)	.98** (3.34)	.98** (2.92)
ACQUIRE * PERIOD2	.10 (.35)	.12 (.44)	.16 (.62)	.16 (.61)	.11 (.40)	.29 (1.13)	.27 (1.00)
SALEGRO		.03 (.58)					.04 (.85)
NETGROA		.03 (.45)					.02 (.38)
ROAAVG		-.17* (-2.46)					-.07 (-.99)
FORWARD			-.08 (-.68)				-.03 (-.30)
BACLWAR				-.08 (-.67)			---
SICSIM			.30** (1.07)	.30** (3.87)			.09 (.94)
CUSTOME			.07 (1.07)	.07 (1.03)			.08 (.01)
CUMVALU					.20** (4.27)		---
CUMNUMB						.31** (6.61)	.25** (4.05)
R square	.20	.23	.29	.29	.28	.32	.34
Adjusted R square	.18	.20	.27	.27	.26	.30	.30

* Significant at the .05 level.
** Significant at the .01 level.
Note: Numbers in brackets are t-score.

Therefore, each individual variable was tested first to examine its impact. Table 4-9 shows the results with transaction number ratio as the dependent variable. Technological relatedness (B = .43), customer relatedness (B = .30), forward relatedness (B = .31), and backward (B = .31) all had a positive impact on telephone and cable companies' selection of diversification targets. Table 4-10 exhibits the results with transaction value ratio as the dependent variable. Likewise, cable and telephone companies were more likely to allocate larger capital resources for the acquisitions of target firms in the industries that had a higher degree of technological relatedness (B = .27), similar customer bases (B = .17), forward relatedness (B = .19), and backward relatedness (B = .20). Therefore, hypotheses 3a, 3b, and 3c were all supported. It is worth noting that technological relatedness seemed to have the large impact of all the four variables.

In order to test the explanatory power of the strategy model, the variables representing technological relatedness, customer relatedness, and forward relatedness (or backward relatedness) were simultaneously incorporated into the model. Forward relatedness and backward relatedness were not included at the same time because they had a perfect correlation (i.e., completely redundant information), and would create some technical problems such as inflated standard errors for estimates of regression parameters.

Table 4-7 summarizes the results, with transaction number ratio as the dependent variable. As shown by the variable SICSIM (B = .44), the diversification ratio tended to be higher when the acquiring and target industries were technologically related. The variable CUSTOME (B = .17) still has the expected positive sign. These results are in accordance with hypotheses 3a and 3b.

Table 4-9. ANCOVA results of hypothesis 3 with variables tested separately (dependent variable based on transaction number ratio).

Variable	Baseline	H3a	H3b	H3c	H3c
	N = 395				
Intercept	-.35** (-2.98)	-.32** (-3.20)	-.35** (-3.17)	-.26* (-2.39)	-.26* (-2.35)
ACQUIRE (telephone = 1)	-.20 (-1.39)	-.17 (-1.39)	-.15 (-1.13)	-.30* (-2.22)	-.31* (-2.26)
PERIOD1 (1984-1989 =1)	.77** (3.93)	.58** (3.27)	.69** (3.77)	.77** (4.24)	.77** (4.23)
PERIOD2 (1990-1995 =1)	.90** (5.39)	.84** (5.77)	.83** (5.29)	.90** (5.74)	.90** (5.73)
ACQUIRE * PERIOD1	.68** (2.83)	.85** (4.06)	.71** (3.15)	.63** (2.77)	.63** (2.78)
ACQUIRE * PERIOD2	-.53* (-2.55)	-.51** (-2.83)	-.49* (-2.55)	-.57** (-2.95)	-.57** (-2.93)
SICSIM		.43** (11.34)			
CUSTOME			.30** (7.36)		
FORWARD				.31** (7.60)	
BACKWAR					.31** (7.54)
R square	.27	.45	.36	.37	.36
Adjusted R square	.26	.44	.35	.36	.35

* Significant at the .05 level.
** Significant at the .01 level.
Note: Numbers in brackets are t-score.

The results of hypothesis 3c are somewhat perplexing (Table 4-7). Both the variables FORWARD (B = -.13) and BACKWAR (B = -.14) now have negative signs. These are contradictory to the previous results when individual variables were tested separately. These results suggest that cable and telephone companies had the tendency to merge with or acquire target firms in the industries that were less vertically related to their core businesses.

Table 4-10. ANCOVA results of hypothesis 3 with variables tested separately (dependent variable based on transaction value).

Variable	Baseline	H3a	H3b	H3c	H3c
	N = 256				
Intercept	-.10 (-.62)	-.07 (-.49)	-.12 (-.79)	-.04 (-.29)	-.04 (-.27)
ACQUIRE (telephone = 1)	-.50** (-2.65)	-.53** (-2.94)	-.47* (-2.54)	-.58** (-3.14)	-.59** (-3.16)
PERIOD1 (1984-1989 =1)	.59* (2.31)	.45 (1.83)	.55* (2.16)	.60* (2.39)	.60* (2.40)
PERIOD2 (1990-1995 =1)	.40 (1.85)	.32 (1.56)	.34 (1.58)	.40 (1.88)	.40 (1.88)
ACQUIRE * PERIOD1	.67* (2.14)	.81** (2.72)	.70* (2.27)	.64* (2.08)	.64* (2.08)
ACQUIRE * PERIOD2	.10 (.35)	.13 (.49)	.13 (.48)	.05 (.19)	.05 (.19)
SICSIM		.27** (5.57)			
CUSTOME			.17** (3.33)		
FORWARD				.19** (3.83)	
BACKWAR					.20** (3.89)
R square	.20	.29	.23	.24	.25
Adjusted R square	.18	.27	.22	.23	.23

* Significant at the .05 level.
** Significant at the .01 level.
Note: Numbers in brackets are t-score.

Table 4-8 reports the ANCOVA results, with transaction value ratio as the dependent variable. The results exhibit the same contradiction. Both forward relatedness

(B = -.08) and backward relatedness (B = -.08) have negative impact. A major reason for this contradiction might be the high correlation among the selected variables.

In spite of the perplexities, the overall adjusted R square shows that the strategy model is able to explain 46% of the variation, which is 20% higher than the baseline model (Table 4-7). In other words, resource relatedness or resource dependency played a more important role in the diversification decision of cable and telephone companies. This model also shows a much higher explanatory power as opposed to the product/market-portfolio model (adjusted R square = .46 versus .26)

Compared to the baseline model, the strategy model (based on ratio of transaction value) also increase the explanatory power by about 10%, as demonstrated by the value of adjusted R square (.27 versus .18) in Table 4-8. It is also slightly better than the product/market-portfolio model (.27 versus .20).

Impact of prior M&A patterns on selections of diversification targets

Prior research suggested that the patterns of previous mergers/acquisitions might have an impact on subsequent merger decisions. Some studies suggested that this might be a strategic response among rival firms (Bolton & Whinston, 1991; Caves, 1991; Nilssen & Sorgard, 1998). Some others argued that this "triggering effect" was due to the cognitive limitation in making a merger decision. Because it is difficult for decision makers to obtain complete information on diversification target markets, firms tend to follow what other companies have done previously (Barr, Stimpert, & Huff, 1992; DiMaggio & Powell, 1983; Haveman, 1993; Reger & Huff, 1993).

Based on these theories, hypothesis four stated that the selection of diversification targets was positively related to prior acquisition patterns of other firms in the same industry. To test this hypothesis, two variables were created to represent the impact of prior merger/acquisition patterns. One was the total number of mergers in an industry by cable systems or telephone companies in the three years prior to the completion year (CUMNUMB). The other was the total transaction value of mergers in a specific industry by cable systems or telephone companies in the previous three years (CUMVALU). Because these two variables were highly correlated ($r = .78$, $p < .01$), each variable was tested separately to prevent multicollinearity problems.

Table 4-7 summarizes the results of ANCOVA procedure for each variable, using transaction number ratio as the dependent variable. As the results demonstrate, the three-year cumulative number of mergers had a positive impact on the subsequent diversification decision ($B = .54$). Likewise, the three-year cumulative transaction value of prior mergers also had a positive impact ($B = .37$). Thus, hypothesis four was supported. It is worth noting that cumulative deal number tended to have a larger impact than cumulative transaction value.

The results based on the transaction value ratio as the dependent variable demonstrate the same pattern (Table 4-8). Both cumulative number of transactions ($B = .31$) and cumulative transaction value ($B = .20$) had a positive impact on cable and telephone companies' selection of diversification targets. Similarly, cumulative deal number had a larger impact than cumulative transaction value. Overall, the high value of adjusted R square as opposed to other models suggests that this model has the highest explanatory power in explaining the diversification patterns of the cable and industries.

Research Questions

Table 4-11 summarizes the hypothesis testing results of the previous section. In addition to the hypothesis testing of the three models of product/market-portfolio, strategy, and prior impact on selection of diversification targets, the present study attempted to compare the relative impact of individual factors and the differences of diversification patterns between cable systems and telephone companies.

Table 4-11. Summary of hypothesis testing.

Hypothesis	Findings	Result
H1a: Cable/telephone companies were more likely to pursue diversification in the 1990s than in the 1980s.	--In general, companies were most likely to pursue diversification in 1996-1999, but least likely in 1990-1995. --Cable systems were less likely than telephone companies to pursue diversification. --Cable systems were most likely to pursue diversification in the 1990s, especially in 1990-1995. --Telephone companies were most likely to pursue diversification in the 1980s, and least likely in 1990-1995.	Partially supported
H1b: Cable/telephone companies faced with slower sales/income growth were more likely to pursue diversification.	--Cable/telephone companies with slower revenue growth rate were more likely to pursue diversification. --Cable/telephone companies with slower net income growth rate were more likely to pursue diversification.	Supported
H1c: Cable/telephone companies were more likely to pursue international expansion in the 1990s than in the 1980s.	--In general, companies were most likely to pursue international expansion in 1996-1999, and least likely in the 1980s. --Telephone companies were more likely than cable systems to pursue international expansion. --Cable systems were most likely to pursue international expansion in 1990-1995, and least likely in 1984-1989. --Telephone companies were most likely to pursue international expansion in 1996-1999, and least likely in 1984-1989.	Supported

Table 4-11—continued.

Hypothesis	Findings	Result
H1d: Cable/telephone companies faced with slower sales/income growth were more likely to pursue diversification.	--Cable/telephone companies with slower revenue growth rate were more likely to pursue international expansion. --Cable/telephone companies with slower net income growth rate were less likely to pursue international expansion.	Partially supported
H2a: Cable/Telephone companies were more likely to select diversification targets in markets with higher profitability (in terms of ROA).	--In both scenario of transaction number ratio and transaction value ratio, cable/telephone companies were less likely to select diversification target markets with higher rate of ROA.	Not supported
H2b: Cable/telephone companies were more likely to select diversification targets in markets with higher revenue/profit growth rates.	--In both scenarios of transaction number ratio and transaction value ratio, cable/telephone companies were more likely to select diversification target markets with higher profit growth rate. --Revenue growth rate in the transaction number ratio scenario had a negative impact. Conversely, it had a positive impact in the transaction value ratio scenario (inconsistent results).	Partially supported
H3a: Cable/telephone companies were more likely to select diversifications targets in technologically related markets.	--In both scenarios of transaction number/value ratio, cable/telephone companies were more likely to select technologically related markets as diversification targets.	Supported
H3b: Cable/telephone companies were more likely to select diversification targets in customer-related markets.	--In both scenarios of transaction number/value ratio, cable/telephone companies were more likely to select customer-related markets as diversification targets.	Supported
H3c: Cable/telephone companies were more likely to select diversification targets in vertically related markets (backward and forward).	--In both scenario of transaction number/value ratio, cable/telephone companies were more likely to select forward related (or backward related) markets as diversification targets.	Supported
H4: Selection of diversification targets was positively related to prior M&A patterns of other firms in the same industry (i.e., cable or telephone).	--In both scenarios of transaction number/value ratio, M&A patterns in the previous three years (in terms of cumulative number of transactions) had a positive impact on the cable/telephone companies' selection of diversification targets. --M&A patterns in the previous three years (in terms of cumulative transaction value) also had positive impact.	Supported

Comparison of Impact of Individual Factors

As shown previously in Table 4-2, some of the independent variables were considerably correlated. Specifically, the variables used in the strategy model (i.e., FORWARD, BACKWAR, SICSIM, and CUSTOME) and in the model of prior impact (i.e., CUMVALU and CUMNUMB) have moderate to high correlations. Questions arose as whether some factors were more influential than the other. Accordingly, the first research question attempted to examine the impact of individual factors that were used in all the models examined, and to compare their relative impact on the selection of diversification targets. To answer this research question, all variables, including dummies used in the baseline model, were subjected to ANCOVA procedure. However, to avoid confusion and problems of multicollinearity and singularity, backward relatedness (BACKWAR) was not included because it had a perfect correlation with forward relatedness (FORWARD). Cumulative transaction value (CUMVALU) was also not included because it was highly correlated with cumulative deal number (CUMNUMB) and was already found to have smaller impact. For comparative purposes, all the variables were standardized using z-score prior to ANCOVA procedure.

It is worth noting that previous hypothesis testing shows that the explanatory power of selected variables tended to be lower when transaction value ratio was used as the dependent variable. The major problem of using transaction value in hypothesis testing is that a large amount of data was unavailable. Moreover, the amount of transaction value can be considered skewed as a result of some large-scale transactions. As such, the testing results based on number of transactions would more appropriately reflect the merger momentum. In the following section, interpretation would focus on the scenario of transaction number ratio. Results in the transaction value ratio scenario are provided only for reference purposes.

Prior diversification patterns

Table 4-7 and Table 4-8 summarize the ANCOVA results. Both tables show that prior M&A patterns in terms of cumulative transaction number (CUMNUMB) had the largest impact on subsequent diversification patterns of the cable and telephone industries (B = .41 and .25, respectively). This implies that cable and telephone companies tended to follow what had been done before.

Technological and customer relatedness

There is also evidence that technological relatedness and customer relatedness also played a considerable role in cable and telephone companies' selection of diversification targets. In terms of transaction number ratio, cable and telephone companies were more likely to acquire or merge with firms in the industries technologically related to their core businesses (B = .19). Mergers were also more likely to occur when the acquiring and target industries had similar customer bases (B = .11).

Interestingly, when all the variables were included in the analysis, forward relatedness turned out to have negative impact on the diversification decision (B = -.08 and -.03, respectively). Because the impact was quite small, this might suggest that vertical relationship was not a major concern in the acquiring companies' diversification decision. Other variables representing market attractiveness such as profitability, revenue growth rate, and profit growth rate all had very small and inconsistent impact.

Differential Impact on Cable and Telephone Industries

Because of the different technological and market characteristics of the telephone and cable industries, factors that affected the diversification decision might have different degree of impact for them. To explore this aspect, the second research question asked whether the same factors might have differential impact on cable and telephone companies' selection of diversification targets.

ANCOVA was performed separately for the telephone and cable industries. All variables were included in the analysis except for BACKWAR and CUMVALU for the aforementioned multicollinearity concerns.

Impact on telephone companies' diversification decisions

Table 4-12 summarizes the ANCOVA results. With transaction number ratio as the dependent variable, technological relatedness (B = .45) had the largest impact on telephone companies' selection of diversification targets. The more technologically related the acquired firms to the acquiring firms' core business (i.e., telephony), the more likely they would be diversification targets. Moreover, telephone companies were also more likely to pursue diversification in the customer related markets (B = .22). Prior diversification patterns in the telephone industry (B = .37) also had a considerable impact. This means that telephone companies tended to follow what the other telephone companies had done before.

Again, the negative impact of forward relatedness (B = -.32) had posed some perplexities for interpretation. The result implies that telephone companies were actually less likely to merge with or acquire target firms in the forward related markets. We believe that multicollinearity was the major problem.

Table 4-12. ANCOVA results of research question 2: comparison of cable and telephone industries.

Variable	Dependent (trans'n number ratio)		Dependent (transa'n value ratio)	
	Telephone N = 244	Cable N = 123	Telephone N = 166	Cable N = 77
Intercept	1.54** (9.99)	1.17** (3.69)	1.42** (6.41)	1.03 (1.71)
PERIOD 1 (1984-1989 = 1)	-1.63** (-11.84)	-.52** (-3.01)	-1.56** (-7.82)	-.59 (-1.68)
PERIOD 2 (1990-1995 = 1)	-.48** (-4.50)	-.79** (-6.09)	-.60** (-3.63)	-.32 (-1.17)
SALEGRO	.02 (.48)	-.12 (-1.05)	.06 (1.07)	-.23 (-.80)
NETGROA	-.03 (-.08)	.02 (.19)	-.04 (-.07)	.23 (.97)
ROAAVG	.09 (1.66)	-.15 (-1.95)	-.04 (-.53)	-.04 (-.24)
BACKWAR	---	---	---	---
FORWARD	-.32** (-2.82)	.51 (.71)	-.24 (-1.59)	.43 (.32)
SICSIM	.45** (4.00)	.06 (.75)	.43** (2.74)	-.09 (-.58)
CUSTOME	.22* (2.09)	.06 (.73)	-.02 (-.13)	.06 (.04)
CUMVALU	---	---	---	---
CUMNUMB	.37** (6.91)	.25 (1.50)	.17* (2.50)	.43 (1.39)
R square	.62	.44	.44	.13
Adjusted R square	.60	.39	.40	-.00

* Significant at the .05 level.
** Significant at the .01 level.
Note: Numbers in brackets are t-score.

Overall, the selected independent variables were able to explain 60% of the variation in telephone companies' selection of diversification targets. The results show a similar pattern in the transaction value ratio scenario. That is, technological relatedness had the largest impact (B = .43). Prior diversification patterns also played an influential role (B = .17). Forward relatedness still had a negative impact on selection of diversification targets (B = -.24). Other variables regarding the degree of attractiveness of the target industries did not show any significant impact and were inconsistent.

Impact on cable systems' diversification decisions

With respect to cable systems, forward relatedness turned out to be the most important role in the acquiring companies' diversification decision (B = .51 and .43, respectively). Cable systems were more likely to merge with or acquire firms in the forward related industries. Most of the industries forward related to the cable industry were other video distribution services such as movie theaters and video rentals.

Unlike telephone companies, technological relatedness (B = .06) and customer relatedness (B = .06) did not have significant impact on cable companies' diversification decision. These results are counterintuitive and seem in contradiction to the outcomes of prior hypothesis testing. It might be that vertical relatedness (including forward and backward relatedness) had considerable correlations with technological and customer relatedness. Thus, holding constant for forward relatedness, the impact of customer and technological relatedness was largely minimized.

Table 4-12 shows that prior diversification patterns in the cable industry also played a critical role (B = .25 and .43, respectively). Like telephone companies, cable systems tended to follow closely what the other cable systems had been doing in the past.

Overall, these factors were able to explained 39% of the variation in the selection of diversification targets by the cable industry in the transaction number ratio scenario. However, the adjusted R square actually turned out to be negative (-.00). A major reason for this problem might be the large missing data, as shown by the small number of observation (N = 77).

Different Paths to Multimedia Market

Because of the exploratory nature of the present research, while it is important to examine the factors influencing the diversification decisions of the cable and telephone industries, the comparison of their selected merger targets is also necessary. The exploration of this aspect is primarily descriptive. Because the present study is based on census data, the comprehensive coverage from 1984 through 1999 would provide a proper basis for the exploration of the different paths to multimedia market between the two competing sectors.

The third research question, thus, attempted to explore how the telephone companies and cable systems had differed in their diversification strategies in terms of target selection. The fourth research question asked what were the sectors that were most attractive to the cable and telephone industries. In other words, what were the industries that were most often pursued, in particular in the multimedia context. The classification of sectors was based on Table 3-X presented in Chapter 3.

Table 4-13 summarizes the merger/acquisition patterns in percentage form based on transaction number; Table 4-14 summarizes the patterns in percentage form based on transaction value. Both the absolute value and percentage are reported for two reasons. First, the absolute number and value of transactions allows us to examine the trading momentum in each sector. Second, the percentage format provides a basis for comparison between the telephone and cable industries. Analysis is primarily based on “eyeballing;” no statistical techniques were implemented.

Table 4-13. Diversification patterns of telephone and cable companies (by transaction number).

year	audio-visual production		comm. equipment		computer		electronic media service	
	telco	cable	Telco	cable	telco	cable	telco	cable
1984								24 (80%)
1985					1 (14%)			13 (100%)
1986		1 (4%)			2 (9%)			21 (88%)
1987				1 (3%)				28 (85%)
1988	1 (3%)	1 (2%)	1 (3%)	1 (2%)	1 (3%)		2 (5%)	52 (87%)
1989	4 (8%)	2 (5%)	2 (4%)				1 (2%)	38 (90%)
1990	2 (4%)		4 (8%)					24 (83%)
1991		2 (13%)	2 (5%)		1 (2%)		2 (5%)	10 (63%)
1992	2 (4%)	3 (9%)	1 (2%)	1 (3%)	1 (2%)		2 (4%)	23 (72%)
1993	5 (8%)	7 (18%)	6 (9%)	1 (3%)	2 (3%)		2 (3%)	21 (53%)
1994	1 (1%)	1 (2%)	4 (4%)	3 (7%)	2 (2%)		5 (6%)	32 (76%)
1995	1 (1%)		4 (4%)		2 (2%)		11 (12%)	52 (84%)
1996	2 (2%)	1 (2%)	4 (4%)	1 (2%)	2 (2%)		6 (6%)	48 (76%)
1997	3 (3%)	1 (2%)	5 (5%)	3 (6%)			7 (7%)	38 (75%)
1998	3 (2%)	3 (5%)	10 (7%)		1 (1%)		5 (3%)	50 (76%)
1999	2 (1%)	6 (6%)	5 (3%)	4 (4%)	3 (2%)		9 (5%)	66 (70%)

year	information service		print media		telecom service		non multimedia-related	
	telco	cable	Telco	cable	telco	cable	telco	cable
1984	1 (6%)				14 (82%)	4 (13%)	2 (12%)	2 (7%)
1985			1 (14%)		2 (29%)		3 (43%)	
1986	4 (17%)		1 (4%)		10 (43%)	1 (4%)	6 (26%)	1 (4%)
1987	4 (25%)			1 (3%)	11 (69%)	3 (9%)	1 (6%)	
1988	5 (13%)			2 (3%)	24 (63%)	2 (3%)	4 (11%)	2 (3%)
1989	1 (2%)		1 (2%)		32 (65%)		8 (16%)	2 (5%)
1990	4 (8%)				31 (63%)	4 (14%)	8 (16%)	1 (3%)
1991	3 (7%)			1 (6%)	31 (70%)		5 (11%)	3 (19%)
1992	4 (8%)			1 (3%)	35 (71%)	3 (9%)	4 (8%)	1 (3%)
1993	3 (5%)	1 (3%)	1 (2%)		40 (62%)	2 (5%)	6 (9%)	8 (20%)
1994	3 (3%)	1 (2%)	3 (3%)		56 (63%)	3 (7%)	15 (17%)	2 (5%)
1995	5 (5%)	4 (6%)	3 (3%)		58 (62%)	3 (5%)	9 (10%)	3 (5%)
1996	14 (15%)				55 (57%)	5 (8%)	13 (14%)	8 (13%)
1997	16 (15%)	1 (2%)		1 (2%)	59 (55%)	2 (4%)	17 (16%)	5 (10%)
1998	42 (28%)	3 (5%)		1 (2%)	75 (51%)	4 (6%)	12 (8%)	5 (8%)
1999	56 (29%)	4 (4%)	1 (1%)	1 (1%)	99 (51%)	3 (3%)	20 (10%)	10 (11%)

Table 4-14. Diversification patterns of telephone and cable companies (by transaction value, $ million).

year	audio-visual production		comm. equipment		computer		electronic media service	
	telco	cable	telco	cable	telco	cable	telco	cable
1984								900 (91%)
1985					36 (11%)			477 (100%)
1986		467 (22%)			576 (38%)			1034 (49%)
1987				34 (1%)				2784 (93%)
1988	27 (1%)	92 (2%)	50 (2%)	230 (5%)	300 (12%)		4 (0%)	3961 (89%)
1989	88 (2%)	17 (0%)	255 (5%)					4298 (99%)
1990			23 (1%)					865 (76%)
1991		1508 (54%)			15 (0%)		5 (0%)	1299 (46%)
1992		15 (2%)	72 (5%)				12 (1%)	706 (86%)
1993	2589 (24%)	51 (4%)	43 (0%)	11 (1%)	59 (1%)			560 (47%)
1994		9600 (41%)	25 (0%)	16 (0%)			1990 (8%)	5815 (25%)
1995	13 (0%)		72 (0%)		3 (0%)		289 (2%)	7752 (98%)
1996			104 (1%)		39 (0%)		408 (2%)	18538 (95%)
1997	3 (0%)		178 (1%)	93 (1%)			646 (3%)	8186 (79%)
1998	21 (0%)	60 (1%)	804 (1%)		190 (0%)		401 (0%)	9533 (95%)
1999	23 (0%)	301 (1%)	1015 (1%)	526 (2%)	5 (0%)		55154 (35%)	27821 (84%)

year	information service		print media		telecom service		non multimedia-related	
	telco	cable	telco	cable	telco	cable	telco	cable
1984	18 (2%)				1071 (93%)	91 (9%)	62 (5%)	
1985			120 (38%)		102 (32%)		57 (18%)	
1986	275 (18%)				136 (9%)		534 (35%)	607 (29%)
1987	337 (19%)				1478 (81%)	190 (6%)		
1988	346 (13%)			177 (4%)	1350 (52%)		505 (20%)	12 (0%)
1989	292 (5%)				3766 (66%)		1263 (22%)	7 (0%)
1990	484 (16%)				2173 (70%)	221 (20%)	440 (14%)	45 (4%)
1991	41 (0%)				8150 (50%)		7953 (49%)	11 (0%)
1992	281 (21%)				966 (71%)	100 (12%)	23 (2%)	
1993					8151 (75%)	274 (23%)	21 (0%)	294 (25%)
1994	562 (2%)				21220 (89%)	47 (0%)	23 (0%)	7975 (34%)
1995	1304 (7%)	109 (1%)	2000 (11%)		14898 (80%)	14 (0%)	44 (0%)	4 (0%)
1996	2174 (12%)				15928 (85%)	180 (1%)	41 (0%)	832 (4%)
1997	1505 (6%)			802 (8%)	21180 (85%)	405 (4%)	1370 (6%)	843 (8%)
1998	2742 (3%)	7 (0%)			81281 (95%)	180 (2%)	149 (0%)	270 (3%)
1999	8351 (5%)	177 (1%)		2000 (6%)	92583 (59%)	1831 (6%)	534 (0%)	554 (2%)

Audio-visual sector

Although the overall percentage based on number of transactions completed by the cable industry did not seem to differ much from that by telephone companies, there is evidence that cable systems were more likely to pursue diversification into the audio-visual sector, especially in the first half of the 1990s. The evidence is more obviously reflected by the percentage based on transaction value. For example, about 54% of the total trading in dollar term by the cable industry went into the audio-visual sector in 1991, and about 41% of the total transactions were for the purchases of companies in this sector in 1994.

The slightly higher likelihood of cable systems to diversify into the audio-visual sector is understandable because they are related to the primary business of the cable industry (i.e., vertical relatedness), and because they have similar customer bases (i.e., audiences). Motion picture production and distribution services were among the most pursued diversification targets in the audio-visual sector. For example, Viacom purchased Paramount for $9,600 million in 1994.

Interestingly, telephone companies also had been pursuing diversification in these sectors since the late 1980s, though the trading level was relatively low as opposed to the cable industry. Most noteworthy is the amount of $2,589 million (24%) invested by the telephone industry in 1993 (five transactions). In this year, US West purchased 25% of Time Warner Entertainment for $2,500 million.

Communication equipment sector

In general, the telephone industry had considerable interest in the sector of communication equipment. The percentage based on transaction number generally remained around the 5% level. However, the amount of capital invested in this sector tended to be quite small. In most cases, the transaction value accounted for only 1% or less.

For the cable industry, although there were some purchases, the transactions seemed quite sporadic. In other words, the communications equipment sector was not major diversification targets for the cable industry.

Computer sector

The sector of computer technology poses a very stark contrast of diversification selection between the telephone and cable industry. Telephone companies seemed to be enthusiastic about diversification into the computer industry in the 1980s, as shown by the high percentages based on transaction value. Most of the mergers were purchases of small computer service providers. The enthusiasm, however, diminished quickly in the 1990s. By contrast, the cable industry has not shown any interest in the computer industry throughout the whole period under investigation.

Electronic media service sector

The very high percentages of mergers/acquisitions by the cable industry in the electronic media service sector were primarily because of the horizontal expansion. Table 4-15 provides the data without horizontal acquisitions by the cable industry. In this table, the acquisitions were either purchases of TV stations or radio stations (i.e., broadcasting). The data show that cable systems had been most enthusiastic about diversification into the broadcasting markets as opposed to diversification in other sectors. Moreover, the interest had remained generally constant throughout the whole period under investigation. One of the most well-known transaction was Viacom's announcement to merge with CBS Network for more than $39 billion in 1999. Because audiences and advertisers constitute the major customer base of electronic media services, this diversification pattern is supportive of the postulation of strategy model that customer relatedness has a positive impact on a company's selection of diversification targets, especially as it applies to the cable industry.

Table 4-15. Mergers by cable industry in electronic media service, excluding horizontal expansion.

year	Transaction number		Transaction value	
1984	11	(37%)	133.7	(13%)
1985	1	(8%)	185	(39%)
1986	1	(4%)		
1987				
1988	2	(3%)	46	(1%)
1989	4	(10%)	41.8	(1%)
1990				
1991	1	(6%)	23.5	(1%)
1992	3	(9%)	12.05	(1%)
1993	5	(13%)	185.924	(16%)
1994	3	(7%)	4.75	(0%)
1995	5	(8%)	164.912	(2%)
1996	2	(3%)	357.083	(2%)
1997	7	(14%)	706	(7%)
1998	4	(6%)	405.074	(4%)
1999	5	(5%)	220.989	(1%)

Telephone companies also exhibited considerable enthusiasm about diversification into electronic media services, especially in the 1990s. However, the mergers mostly occurred in the cable market instead of the broadcasting industry. Bell companies, and US West in particular, were the most active in acquiring cable systems. One of the high-profile transactions in this sector was AT&T's acquisition of TCI in 1999 for nearly $54 billion.

Information service sector

Apart from computer industry, information service is another sector that poses a stark contrast of diversification interest between the telephone and cable industries. As demonstrated by the data, telephone companies started to acquire information service companies in the 1980s. In fact, data show that information service sector was the second most pursued diversification targets by telephone companies, ranking only next to telecommunications services. Nearly all major common carriers in the U.S., including Bells companies, long-distance companies, and other big telephone companies such as GTE and Alltel, had been active acquirers in this sector. In addition, data reveal that the trading momentum both in terms of transaction number and transaction value reached the highest level in the second half of the 1990s.

In contrast to the enthusiasm of the telephone industry, the cable industry had not exhibited much interest in the diversification into the information service sector. The trading activity only started very slowly from 1993. Furthermore, the trading level had been quite low. In light of the potential of cable for broadband services, the lack of interest of the cable industry in acquiring information service companies is somewhat unexpected.

Print media sector

Although print media could be a very important source of information content in the multimedia industry, neither the telephone nor the cable industries had exhibited much interest in acquiring companies in this sector. As the data show, there were only a few mergers throughout the years, and the trading level was quite low. For the telephone industry, print media was the least attractive sectors in the multimedia-related industries. The cable industry had only a slightly higher interest in this sector than in the computer sector. It is worth noting that newspaper and magazine were the primary targets for cable companies, whereas telephone companies were also interested in other types of publication such as directory and advertising.

Telecommunications service sector

It is expected that the telephone industry would have a very high trading level in the telecommunications service sector. A major reason for the high trading level was horizontal expansion. Nevertheless, the trading level was still very high even when horizontal mergers/acquisitions were excluded (Table 4-16). Since 1986, trading level in this sector by telephone companies had remained generally above the 20% level in terms of transaction number. The trading level was even higher in dollar term. Most of the acquired firms were wireless service providers, such as cellular/mobile phone or paging services.

Some important mergers include AT&T's acquisition of McCaw Cellular for more than $15 billion in 1994, SBC Communications' purchase of Comcast Celluler for $1,674 million in 1999, and MCI WorldCom's acquisition of Skytel for $1,832 million in 1999. However, data also reveal that trading activity, after reaching the peak in the first half of the 1990s, dropped dramatically after 1995. It seemed that the diversification interest had shifted to the information service sector.

Table 4-16. Mergers by telephone industry in telecommunications service, excluding horizontal expansion.

year	Transaction number		Transaction value	
1984	1	(6%)		
1985				
1986	5	(22%)	18	(1%)
1987	7	(44%)	1478	(81%)
1988	8	(21%)	272.4	(11%)
1989	7	(14%)	2124.6	(38%)
1990	4	(8%)	295	(9%)
1991	9	(20%)	954.997	(6%)
1992	10	(20%)	186.881	(14%)
1993	10	(15%)	6371.278	(59%)
1994	22	(25%)	19883.136	(83%)
1995	23	(25%)	8214.205	(44%)
1996	24	(25%)	1767.123	(9%)
1997	10	(9%)	178.377	(1%)
1998	19	(13%)	1675.01	(2%)
1999	33	(17%)	9079.25	(6%)

It is worth noting that the cable industry seemed to have maintained considerable interest in the telecommunications service sector in the 1990s. Major target firms for cable systems were wireless service providers. In fact, it seems that cable companies were equally interested in the broadcasting industry and the telecommunications service sector. The percentages based on transaction number in both sectors tended to remain at around the 10% level (Table 4-13 and Table 4-14). Nevertheless, data also show that the enthusiasm about telecommunications service diminished in the second half of the 1990s. A possible reason for this drop might be that the cable industry had started to recognize the technological difficulties and economic impracticality of providing telephony services via cable wire (Aufderheide, 1999).

Non-multimedia-related sectors

Although multimedia-related merger/acquisition is the major concern of the present study, the diversification trend of the telephone and cable industries in the non-multimedia-related sectors exhibits some interesting patterns. The considerably high percentages based on both deal number and transaction value demonstrate that the telephone industry had allocated a considerable proportion of capital resources for non-multimedia-related acquisitions in the 1980s. This implies that the industry had a quite wide range of diversification targets. Nevertheless, the trading momentum in the non-multimedia-related sectors dropped quickly in the 1990s, especially in terms of transaction value. Telephone companies had increasingly shifted attention to horizontal expansion and multimedia-related diversification.

A check of the database reveals that electronic and electrical construction works were the most pursued by telephone companies in the non-multimedia-related sectors. These companies provided services such as equipment installation and maintenance. It is believed that acquisitions of these target firms were mainly intended for services such as equipment maintenance and repair, which is a critical part of telephone service (Gershon, 2001, chapter 5).

By contrast, the cable industry had a very low trading level in the non-multimedia-related industry in the 1980s. During this period, the cable industry’s acquisition targets had concentrated in electronic media services (including horizontal expansion and diversification into broadcasting). However, the cable industry started to broaden the diversification targets not only into multimedia-related but also non-multimedia-related sectors. The change is most obvious in the first half of the 1990s.

A check of the database shows that acquisitions of professional sports clubs or teams accounted for a considerable part in non-multimedia-related diversification for cable systems. Interestingly, ownership of professional sports teams seemed to be a quite unique phenomenon in the media industry. A major reason for this might be that sports activities are an important programming source in the U.S. Thus, cable systems were likely to acquire sports teams for programming purposes.

In summary, the telephone industry had a wider range of diversification targets and more diffuse patterns of acquisition than the cable industry. Particularly in the 1980s, around 70-80% of the transactions by the telephone industry were mergers with or acquisitions of companies outside its traditional wireline telephony business. Moreover, non-multimedia-related mergers accounted for a considerable proportion (between 10% and 30%). The level of horizontal expansion, however, started to rise at the end of the 1980s and continued nearly throughout the 1990s; the trend is most obvious when viewed in dollar terms.

The cable industry tended to constantly concentrate on horizontal expansion, though the level dropped slightly in the first half of the 1990s. Horizontal mergers completed by the cable industry were mostly within the range of 60% to 90% of the total trading volume. Moreover, cable companies had a smaller range of diversification targets than telephone companies.

With respect to diversification strategies, companies in the industries that were considerably related to the acquirers' traditional markets were the most pursued. For telephone companies, complementary telecommunications service providers such as paging and wireless telephony accounted for the largest proportion of the diversification targets. For cable systems, broadcasting and particularly television stations were the most attractive acquisition targets. Companies in the audio-visual sector also were attractive diversification targets for cable systems.

The fact that wireless telephony was the most attractive diversification target market, and that electronic media and audio-visual sectors were the most pursued targets for cable systems suggests that technological and customer relatedness played a critical role in cable and telephone companies' diversification decisions. In addition, the selection of diversification targets in the non-multimedia-related sectors also supports the conclusion. Telephone companies were more interested in acquiring electronic/electrical construction works because these firms play an essential part in maintaining telephony service quality. On the other hand, because of the popularity of sports programming in the U.S., purchases of professional sports teams accounted for the largest proportion of non-multimedia-related diversifications for cable companies.

CHAPTER 5
DISCUSSION

This study investigated merger and acquisition (M&A) patterns of the cable and telephone industries from 1984 through 1999 in the multimedia context from a longitudinal and comparative perspective. The first part examined how the changes in regulatory environment and corporate performance in the core business affected cable and telephone companies' decisions to pursue diversification or horizontal expansion. Whether the same factors also affect the companies' decision to pursue international expansion was also investigated.

Built on the hypothesis that deregulation in the U.S. telecommunications industries would provide cable and telephone companies with more flexibility and incentives to pursue diversification, second part of this study took a further step to examine the factors influencing cable and telephone companies' diversification strategies. Three theoretical frameworks were adopted to examine how these factors might affect the acquiring companies' selection of diversification targets: (1) the attractiveness of the target markets, (2) the relationship between the acquiring and target industries, and (3) the impact of prior M&A patterns.

The third part of this study explored cable and telephone companies' selection of target markets in the multimedia context. Specifically, the comprehensive M&A database used for this study allows us to explore which multimedia-related industries were the most pursued by the two industries. This chapter summarizes the findings and hypothesis testing results, and discusses the regulatory and managerial implications.

Impact of Deregulation and Corporate Performance on M&A Patterns

As computer and telecommunication technologies continue to develop rapidly and become commercially available, the emerging multimedia market, especially broadband services, has become a potential goldmine for the future. It would be reasonable to expect that multimedia-related industries would become attractive new business opportunities for the cable and telephone industries, which have become the most visible multimedia service providers. An important consequence of technological advancement in telecommunications is that the traditional definition of telecommunications has increasingly blurred, which made former telecommunications regulatory structure based on traditional market definition increasingly difficult to implement. Thus, whereas technological advances would be the fundamental force behind the merger wave in the 1990s, it was deregulation that set off the merger wave.

Impact of Regulatory Changes

The present study divided the 16 years from 1984 through 1999 under investigation into three periods to capture regulatory changes in the U.S. telecommunications industries. Based on the results presented in the previous chapter, regulatory changes had affected merger activities of the cable and telephone industries in three major aspects.

First, as the U.S. telecommunications industries were increasingly deregulated in the 1990s, the level of merger activity of telephone and cable companies continued to rise.

The trend was most obvious in the second half of the 1990s, especially in the telephone sector. It is during this period the telecommunications industries underwent the most dramatic restructuring as a result of the passage of the pro-competition 1996 Act.

With regard to the cable industry, the increase of trading level in the mid-1980s and a quick drop in the late 1980s provides another telling example of the impact of regulatory changes on M&A activity. With the passage of the 1984 Cable Act, the FCC removed the previous price freeze on the cable market. Price control was also removed in an attempt to promote competition. As a result, the cable industry began to grow rapidly, and the level of trading of cable systems also started to rise rapidly. However, trading activity of the cable industry dropped for a short period in the late 1980s and early 1990s. The decrease was mainly because of a decrease in horizontal mergers. A major reason for this downturn might be that cable systems had begun to hold a pessimistic view of the cable market in anticipation of the passage of the 1992 Cable Act, which imposed strict price control and ownership restriction on the industry. The M&A activity in the cable industry started to surge again in the mid-1990s, in anticipation of the 1996 Act. This implies that regulatory changes had played a decisive role in determining the merger momentum of the telecommunications industries. When deregulation occurred, trading level rose in response. By contrast, trading activity dwindled when the industries were under tighter regulations.

Second, changes in the regulatory environment affected not only the level of trading activity but also the M&A strategies of the cable and telephone industries. Because ownership rules and line-of-business restrictions have been a major part of telecommunications regulations, especially in the telephone industry, regulatory changes have also substantially influenced the merger patterns of telecommunications firms. For example, the 1982 Consent Decree led to AT&T's divestiture of Bell systems in 1984 and imposed very strict rules regarding business combination on local telephony markets. Consequently, most mergers by telephone companies in the 1980s were limited to non-telecommunications-related industries.

On the other hand, cable systems tended to concentrate on horizontal expansion because the industry had enjoyed historically the freedom in pursuing horizontal expansion. In the 1990s, the telecommunications industries were increasingly deregulated. Concentration of ownership was much more tolerated than before, and the line-of-business rules were substantially relaxed. Consequently, the 1990s not only saw the level of horizontal expansion rise quickly in the telephone industry, especially in the late 1990s. There was also a high level of diversifying mergers and acquisitions into those markets that were formerly prohibited, such as information services and computer sectors.

The third aspect of regulatory impact is in regard to the global market. That is, as global telecommunications markets underwent liberalization and privatization, international expansion became an important merger strategy for telephone companies. Bell companies and long distance providers were the major players in this area. The cable industry also exhibited some interest in internationalization in the 1990s, but the trading level was slightly lower than that of the telephone industry.

Impact of Core Business Performance

In addition to regulatory changes, business status of cable and telephone companies in their traditional markets was found to have some impact on their merger/acquisition patterns.

Based on the literature reviewed, companies faced with slower revenue growth are more likely to pursue diversification. As Ansoff (1988) pointed out, companies are likely to turn to other business opportunities or internationalization when they are faced with declining sales or earnings. Accordingly, we hypothesized that cable and telephone companies were more likely to pursue diversifying mergers when they were confronted with slower revenue or income growth. Statistical results support the hypothesis.

With regard to international expansion via mergers/acquisitions, statistical results show that cable and telephone companies faced with slower revenue growth were more likely to turn to global markets for new business opportunities. However, it was found that the companies were more likely to pursue international expansion when they had higher net income growth. What exactly caused this inconsistency is not clear. One possible explanation is that net income might not be a good predictor because it often involves management discretion in the calculation. Unlike operating income, net income factors in interest and tax expenses. Because these items are not directly linked to operations of business, companies may come up with substantially different numbers just by the way they fund their cash needs, or as a result of different tax strategies (Silbiger, 1993, chapter 3). Thus, the use of net income growth rate to represent a cable or telephone company's business status was unable to provide adequate predictive power.

Factors Affecting Selection of Diversification Target Industries

So far, we have examined the impact of regulatory changes and core business performance on cable and telephone companies' decisions in pursuing diversification or horizontal expansion. Given the decision to pursue diversification, we continued to ask what were the criteria for selecting a diversification target. This study drew on three theoretical frameworks to address this issue from different perspectives.

In the preceding chapter, we used both transaction number ratio and transaction value ratio as dependent variables and tested the hypotheses separately. Statistical results based on transaction value ratio tended to have lower explanatory power and were in some cases inconsistent with the results based on transaction number ratio. We would like to point out here again that because trading level in dollar term is susceptible to distortion of large-scale transactions or missing data, it is less likely to reflect accurately the trading momentum of mergers and acquisition under investigation. As such, the discussion in the following section is primarily based on statistical results in the transaction number ratio scenario.

Attractiveness of Target Markets

The first model (product/market-portfolio model), based largely on corporate portfolio literature, states that the degree of attractiveness of a diversification market depends on a wide variety of financial indicators such as market growth rate, earnings, product life cycle (Salter & Weinhold, 1979; Silbiger, 1993). Based on this model, the present study used market growth rate, profit growth rate, and rate of return on assets (ROA) to represent the attractiveness of target markets.

Statistical results support the postulations of this model by showing that cable and telephone were more likely to select the industries with higher profit growth rates. However, contrary to postulations of this model, results also show that cable and telephone companies were actually more likely to enter a new market with lower ROA rate and lower revenue growth rate. In addition, the explanatory power of this model is very low.

The counterintuitive results that cable and telephone companies would prefer markets with lower ROA and revenue growth rates makes one wonder why a company would want to enter these markets. One possible reason for this discrepancy might be that attractiveness of a new market in terms of the selected financial indicators was not a major determinant in cable and telephone companies' decisions on diversification target selection. There could be other factors that were more influential. The low explanatory power of this model provides some evidence that this might be the case.

Another possible explanation can be found in Gort's (1969) economic disturbance theory of mergers. According to the author, "discrepancies of valuation for income-producing assets arise from differences in expectations about future income streams and the risks associated with expected income" (p. 626). In other words, mergers or acquisitions are most likely to occur when the potential acquiring firms and the current owners of corporate assets may differ in their evaluation of the future of the market. Under these circumstances, acquiring firms tend to hold an optimistic view about future potential of the market and place a higher value on the corporate assets. Conversely, the current owners are less optimistic and more willing to sell the assets. This implies that when a market is confronted with a lower rate of return on assets or revenue growth, there would be more incumbents who are looking for potential buyers. Consequently, there tends to be a higher trading level in industries with lower ROA or lower revenue growth rate.

The inadequacy of the product/market-portfolio model to account for the diversification patterns in the cable and telephone industries could also be explained from the perspective of "real options." Merger/acquisition is a type of investment decision. From the viewpoint of real options, the traditional investment strategy formulation based on discounted cash flow (DCF) is unable to reflect managerial flexibility in making an investment decision. The DCF-based analysis is linear and static in nature and assumes the investment opportunity is not totally reversible or is a now-or-never opportunity. It also implicitly assumes that companies would only pursue those investment opportunities that allow the firms to exploit temporary competitive advantages (Lander & Pinches, 1998; Luehrman, 1998; Panayi, & Trigeorgis, 1998).

Given the all-encompassing nature of multimedia and the uncertainties of the emerging market, the concept of real options is appropriate in examining the M&A patterns of the cable and telephone industries. According to Panayi (1998), among the most important real options are those involving multi-stage decisions or compound growth options, that is, options whose exercise brings forth additional options as well as generating cash flows. Infrastructure investment, the acquisition of another company, and a decision to enter a new market are examples of investments that are likely to open the door to future opportunities. An important implication of the nature of mutli-stage decision and the focus on the potential value of assets for further projects is that the evaluation of a merger based on current market grwoth rates might not be reflecting the real decision considerations. As a result, the product/market-portfolio model did not have good explanatory power.

Related Diversification as Strategic Decision

Instead of focusing on the attractiveness of a new market as a major incentive for corporate diversification, some M&A analysts approached corporate diversification decision from a strategic perspective and focused on the relationship between the acquiring firm and the target. Drawing on the concept of "strategic fit" posited by the resource-based view (Barney, 1986, 1991; Dierickx & Cool, 1989; Markides & Williamson, 1996; Peteraf, 1993) and the resource dependency theory (Klavans, 1990), the present study found that cable and telephone companies were more likely to diversify into new markets that were technologically or vertically related to the acquiring firms' core businesses. Diversifying mergers and acquisitions were also more likely to occur when the traditional markets and new markets had similar customer bases.

For example, wireless telephony such as paging services was a major diversification target for the telephone industry because they were technologically related (as illustrated by the similar SIC codes) and also because both markets were serving customers for similar needs (i.e., communication). Similarly, cable systems were most likely to acquire broadcasting stations or other video distribution/production firms because they had similar customer bases or were vertically related. Indeed, the diversification into technologically or customer related markets not only provided the acquiring firms new business opportunities, but also allowed them to expand the core competence into the new markets. For example, cable systems' entry into electronic media service and audio-visual sectors would allow them to expand content and marketing skills into the new markets. By contrast, telephone companies were most enthusiastic about entry into information and wireless telephony services because they could build on the developed technological competence and management skills to gain a strong position in the new markets.

Statistical results show that this model can explain cable and telephone companies' diversifying mergers and acquisitions better than the previous product/market-portfolio model. This suggests that relationship between the core business and the target market played a more important role.

Following the Diversification Trend

A number of prior studies on corporate behavior noted that in many cases managers had only limited information when they made decisions, especially in a fast-changing and uncertain environment. (DiMaggio & Powell, 1983; Haunschild, 1993; Haveman, 1993). Under these circumstances, companies tend to follow the behavior of other companies with similar characteristics. Alternatively, some other studies on merger activities from the sequential perspective concluded that similar merger patterns in an industry over time might be a result of strategic responses to competitors' actions (Bolton & Winston, 1991; Caves, 1991; Colangelo, 1995).

Statistical results presented in the previous chapter demonstrate that cable and telephone companies' selection of diversification targets were considerably affected by previous diversification patterns in the respective industries. However, because the statistical analysis was based on merger data, it is not clear whether similar patterns of diversifying mergers in the cable and telephone industries was simply a result of mimetic behavior or a strategic response to competitors' actions.

We speculate that, to a certain degree, both explanations might be true for two reasons. First, multimedia is a newly emerging industry and does not have a clear-cut market boundary. According to Porter (1980, chapter 10), emerging industries often share some common structural characteristics, such as technological uncertainty, strategic uncertainty, and first-time buyers. With respect to technological uncertainty, questions such as what constitutes the best product configuration, or which production technology will prove to be the most efficient are difficult to answer. From the viewpoint of strategy formulation, there are yet no rules in regard to product/market positioning, marketing, servicing, and so on.

As such, cable and telephone companies are confronted with difficulties in obtaining sufficient information about the competitors, formulating strategic position, or knowing which market segments to enter. Under these circumstances, it is possible that decision makers would simply follow the trend.

Second, multimedia or information industry is a type of network economy (Egan, 1996; Shapiro & Varian, 1999). An important feature of network economy is the existence of positive feedback—the larger the customer base, the more valuable and attractive the network to potential customers. This implies that first companies to achieve critical mass would be more likely to create a strong competitive position and eventually take over the market. It also means late comers could run the risk of being driven out of the market completely. The feature of positive feedback, thus, could serve as a pre-emptive mechanism that gives early entrants in the multimedia market first-mover advantages (Lieberman & Montgomery, 1988; Mueller, 1997). From this viewpoint, it is reasonable to expect that companies would respond to rivals by taking similar actions.

M&A Strategies: Cable versus Telephone

All in all, the examined factors had similar impact on telephone and cable companies' selection of diversification targets. Both industries were more likely to acquire companies in the industries that strategically related to their core businesses. This strategy of related diversification not only provided the diversifying firms opportunities to extend their core competence into other markets, but also served as a means of enhancing competitive advantages in their traditional markets.

Both industries were also more likely to acquire companies in the industrial sectors that were most pursued previously. Market attractiveness in terms of did not seem to play an essential role in both industries' diversification decisions. Neither industry seemed to pursue diversification mainly because of the high growth and profitability of the target markets.

The factors of strategic relatedness and prior impact were likely to lead cable systems and telephone companies to pursue different diversification patterns because the two industries had been subject to different regulatory structures and have developed different core competencies as a result of different market nature and technological characteristics. An important implication of these differences is that cable systems and telephone companies would focus on different sectors for corporate diversification in the multimedia context.

M&A Strategies of Cable Industry toward Multimedia

Although cable TV owners have shown some degree of diversification in their acquisition planning, purchases of other cable companies (i.e., horizontal integration) still accounted for more than 60% of total merger deals over time. Presumably, "clustering" has been the major acquisition strategy, which served to create a broader and seamless market areas. In addition to scale economies in technology implementation and market power, regional clusters also would be more attractive to regional advertisers seeking to reach audiences outside the more limited franchise areas. Moreover, the strategy of consolidating numerous franchise areas into one broader service region was believed to provide cable companies with competitive advantages in the multimedia markets such as cable telephony, broadband access, and other information services.

While digital technologies have increasingly enhanced the strategic role played by the cable industry in media convergence, cable TV is conventionally a video programming service provider. Accordingly, it is not surprising to find that cable companies would have a certain degree of interest in acquiring TV stations and in having a stake in the audio-visual sector, though to a lesser extent.

The cable industry also showed certain interest in the acquisition of telephone companies, especially in the early 1990s. This suggests that entry into telephony services might be an attractive sector in the cable industry's diversification planning when the industry was re-regulated by the 1992 Cable Act. However, the interest seemed to level off in the second half of the 1990s. The quick withdraw from telephone market might be due to the recognition that provision of voice service over tree-like cable network was faced with technological complexity as opposed to the switching-based, star-like telephone infrastructure. Moreover, cable telephony is still prohibitively expensive, making it difficult to compete with traditional telephone services.

In spite of the its potential in the broadband market, the cable industry has not demonstrated much enthusiasm in the acquisition of information services providers. The percentage was still less than 5% even after the passage of the 1996 Act when telephone companies started to aggressively acquire information service providers. This is somewhat unexpected. Even though cable modem technology accounted for more than 60% of the high-speed service market, the gap between cable modem and DSL market share has become increasingly narrow, as a result of telephone companies' aggressive planning in DSL deployment.

From the viewpoint of strategic formulation, the industry's concentration on horizontal mergers and continuous interest in the broadcasting and audio-visual sectors suggests that cable systems tended to focus on content-based segments in the multimedia market. Indeed, video delivery service is still a cash-generating market. There is less need for pursuing diversification into new, unfamiliar markets. In addition, broadcasting and audio-visual markets share some common characteristics with the cable market, such as programming and marketing skills. The strategy of integrating cable, broadcasting, and other audio-video distribution services would enable cable systems to develop a strong position in the multichannel market against new entrants such as DBS.

M&A Strategies of Telephone Industry toward Multimedia

In contrast to the cable industry, the telephone industry has historically maintained a high degree of diversifying merger/acquisition. In the second half of the 1980s, diversifying mergers generally accounted for 60%-70% of all the transactions completed by telephone companies. Major diversification target markets during this period were wireless telephony service providers and, to a lesser extent, electronic and electrical work installation firms. Information service providers—mostly integrated system and software design companies—were also important merger targets. Overall, it seems that the mergers mostly concentrated on telephony-related markets.

As the telephone industry was gradually deregulated in the first half of the 1990s after a series of Computer Inquiry III proceedings, telephone companies' M&A patterns started to change. Telephony-related targets such as wireless service providers continued to be the largest diversification target market. Both number and value of acquisitions of wireless service providers rose rapidly in this period. Communication equipment manufacturers also became important merger targets at this time. In addition, the level of horizontal expansion started to rose gradually. Like the 1980s, the major M&A strategies in the first half of the 1990s were still oriented toward creating a strong position in the telephony-related markets.

Interestingly, it is also during this time period that telephone companies began to show certain enthusiasm about entry into video service markets. Trading level in the broadcasting, audio-visual, and especially cable TV sectors began to increase. Telephone companies' interest in the cable TV market can be traced back to the early 1980s when the United States Independent Telephone Association petitioned to the FCC to drop the restriction on local cross-ownership (Baldwin, McVoy, & Steinfield, 1995, pp. 10-13). The need for business diversification into the cable market has become more acute in the 1990s when the telephone market became increasingly competitive and was growing only slightly (Foley, 1992).

Telephone companies' M&A patterns underwent another shift in the second half of the 1990s. Most noteworthy is the dramatic increase of trading level in the information service sector. Prior to 1996, the number of transactions in this sector generally remained at only four mergers per year. Starting from 1996, the number rose by nearly 300% to 14 mergers, and reached the highest level of 56 transactions in 1999. Moreover, the nature of the acquisitions in the information sector also underwent an important shift. Prior to 1996, integrated system design accounted for the largest proportion of telephone companies' merger targets. The major purpose might be to improve service quality of the "intelligent networks." In the second half of the 1990s, the number of purchases of data processing and information retrieval services (mostly ISPs) increased substantially. As the market size of information services continues to grow, it is expected that telephone companies' interest in this sector will remain at a considerable level.

Another obvious change of M&A patterns in this period is the considerable decrease of trading in the wireless telephony sector. It is not clear why the trading momentum lost steam in such a short time, even though the market continued to grow rapidly. We speculate that the FCC's duopoly policy in the wireless market had effectively introduced rigorous competition into the market, thus making the business not as profitable as expected. According to FCC's report (2000c), there were nearly 6.4 million wireless subscribers as of June 1991; this compared to more than 97 million subscribers as of June 2000. However, the price also dropped exponentially. Average monthly bill was about $70 in 1991; the price plunged to only $40 in 1999.

It is worth noting that although the percentage of horizontal mergers in terms of transaction number dropped in the second half of the 1990s (slightly higher than 40%), several large-scale mergers between Bell systems pumped up the percentage in dollar term to around 70-80%. Today there are only four Bells, as compared to seven in the 1980s.

As opposed to cable systems, the telephone industry demonstrated certain interest in the communication equipment and computer industries. The early history of vertical integration of telephony services and equipment manufacturing and the increasingly close interdependence between telephony and computer technologies might be a major reason for this unique situation.

Compared to cable systems' concentration on horizontal mergers and audio-visual diversification, M&A strategies of the telephone industry toward multimedia were much broader in scope. The breadth of M&A patterns gives the industry's presence in almost every segment in the multimedia market, including voice, video, and data. On the other hand, the acquisitions of communication equipment manufacturers would give telephone companies a strong position in vertical integration.

To sum up, the different M&A patterns reveal that cable systems continued to focus on audio-visual distribution and production. Telephone companies, by contrast, were more enthusiastic about providing information services—in particular voice and data processing—on an integrated basis.

Regulatory and Managerial Implications

As the present has established the significant role of regulatory changes on merger/acquisition strategies, there are important policy implications. At most important issue is the impact of the 1996 Telecommunications Act. The underlying principle of the new act is the economic benefits that may result from deregulation and competition, and the recognition of the emergence of telecommunications convergence. Based on these two criteria, the policy implications can be examined from two perspectives: first, the impact of deregulation on market competition and, second, the impact of technological convergence on regulation. Because government policy can affect market structure and business operation, the present study also has managerial implications.

Impact of Deregulation on Market Competition

One of the major concerns with the 1996 Telecommunications is that whether it would lead to market concentration or competition. First, some scholars have criticized that deregulation, and in particular the relaxation of ownership concentration restrictions have resulted in financial concentration rather than technological convergence (Aufderheide, 1999). Conversely, some scholars have argued that the 1996 Act is more a re-regulation than deregulation (Campbell & Barnett, 1997). Indeed, there are reasons to believe that both camps are right.

With regard to the criticism of ownership concentration, the phenomenal increase in mergers/acquisitions in the 1990s does give rise to concerns about the potential anticompetitive behaviors of concentrated markets. However, whether concerns of this kind are warranted is questionable. For example, the rules of network interconnection and nondiscriminatory access to the telephone network elements all make it unlikely for the Bell systems to exert monopoly power. Moreover, there are other potential entrants such as the long-distance carriers, other Bell companies, and competitive access providers. This would serve as a checking mechanism against the potential monopoly power of local common carriers.

In the case of cable systems, the potential entry by telephone companies and the competition from DBS also play an important role in guarding against the potential monopoly power of cable operators. In other words, while the overall deregulated telecommunications markets give firms more flexibility to pursue business consolidation, they serve at the same time as checks and balances that make anticompetitive abuses unlikely.

With respect to the criticism of re-regulation rather than deregulation, it is true that the government has yet to further relax restrictions in some respects, especially on the Bell systems. The implication of this point is that the government should consider whether the residual restrictions are beneficial to the consumers or eventually harmful for technological development. For example, the Bell systems are still prohibited from entering electronic publishing, while cable systems are virtually free from any restrictions of this kind. While telephone companies and cable systems would be competitors in the broadband service market, the regulatory asymmetry may put Bell systems in a disadvantaged position in content provision, hence reduce the effectiveness of "two-wire solution."

In summary, market concentration is itself not an evil. If real competition or potential competition exists, a concentrated market may still be beneficial in that it is more efficient and likely to generate economic gains.

Impact of Technological Convergence on Regulation

The previous discussion addresses the impact of regulation/deregulation on market competition and technological advancement. Conversely, technological convergence also has exerts impact on regulation. First, because of the great variety of information services that can be provided over a single network, market boundaries have become increasingly difficult to define. A broad definition of the market would tend to lower the concentration ratio. A narrow definition of the market would tend to raise the concentration ratio. This discrepancy between broad and narrow definitions may arise because a few firms tend to dominate each group but the same firms do not dominate all the groups. A major regulatory concern with the multimedia industry is that whether the market should be defined by information product, by distribution technology, or by other criteria.

Given the difficulty in market definition by information content, the definition based on distribution technologies might be an alternative. However, there are problems in this respect due to the differential characteristics of transmission technologies. At the current stage, the cable network is more suitable for the transmission of video signals, while the telephone network is suitable for switched voice transmission. At the same time, there are other wireless transmission technologies such as satellite and broadcasting systems. This leads to the problem of whether all networks should be treated equally and subject to the same regulations.

For example, once the cable modem technology is mature for telephony service, should the cable network be treated as a common carrier and required to provide universal service and interconnection? Similarly, once telephone companies are able to enter the electronic publishing market, should they be subject to indecency and obscenity rules as are television broadcasters? How about the Internet, of which the issue of pornography has been controversial?

Second, the combination of content and distribution gives an integrated company the ability to bundle services, differentiate products, and charge differential prices. While such business strategies are beneficial to customers as well as the companies, they are also prone to anticompetitive consequences. With respect to price differentiation, the Robinson-Patman Act of 1936 says that price discrimination is illegal if it reduces competition. Because there is some gray area between competitive strategy and anticompetitive behavior, this may require some wisdom in addressing these issues.

Managerial Implications of M&A Strategies

This study also has managerial implications that may be useful for cable operators and telephone companies. Because both industries are now considered potential competitors to each other, the resultant merger/acquisition patterns may provide a general picture of how these companies are doing to create competitive advantages.

For example, by having a better understanding of what firms other companies are acquiring, managers can decide whether to pursue the same strategies or to adopt other strategies such as product differentiation or focus (e.g., consumer segments or market segments). A better understanding of the M&A patterns also allow managers to examine whether mergers or acquisitions actually improve corporate performance or conversely put the companies under heavy debt burden. For example, the recent announcement by AT&T to divest its several subsidiaries has made people question whether it is advisable to pursue diversification in such an aggressive manner, and whether it is a guaranteed success to be first movers into an emerging market.

On the other hand, because of the existence of economies of scale, scope, and sequence (vertical integration), and the positive feedback mechanism in the multimedia industry, larger companies may have a better competitive position as opposed to the other existing but smaller ones and to potential entrants. For example, a large cable operator may enjoy lower costs due to the economies of scale. This gives the company a better position in the competition against the existing rivals such as a cable overbuilder, DBS, or other multichannel providers (i.e., MMDS). Simultaneously, the cost advantage also makes it harder for potential entrants to enter the market.

Take AOL as another example. Because of its dominant position in the ISP market, it can achieve economies of scale. Because of its merger with Time Warner, it is also likely that AOL can employ product differentiation and price discrimination to create entry barriers to potential entrants, or develop competitive advantages against existing rivals. AT the same time, because of its large network, it has relatively large bargaining power against its buyers such as advertisers. It also has large bargaining power against its suppliers such as content providers.

Academic Contributions

In addition, the present study also contributes academically. First, the merger wave in the telecommunications is a recent phenomenon. There are not many empirical studies in this respect. Moreover, the focus on multimedia is quite current. It is hoped that this research will serve as a stimulus for further research and thus provide more insights into the M&A dynamics in the telecommunications industry.

This study took a comparative approach to the M&A patterns of the cable and telephone industries. The comparison between cable systems and telephone companies is important because they are currently viewed as the major players in the broadband service market. An important implication is that mass media researchers should broaden their scope of research area because the distinction between media and telecommunications has increasingly blurred. It is counterproductive if we still continue to treat cable operators only as video service providers and common carriers as simple voice service providers.

Limitations and Suggestions for Future Research

There are several limitations in this study. Of most concern is the potential systematic errors caused by the missing data. Because some companies were small in scale and not publicly listed, data such as transaction value or corporate revenues were unavailable. A possible consequence is that the results do not accurately reflect the characteristics of the population. That is, data were available mostly when the acquirers were large companies or publicly listed companies. It is possible that smaller companies might have substantially if not dramatically different merger patterns as opposed to large companies. Consequently, the research results would reflect at best the M&A dynamics of large companies.

A second major limitation is the problem of multicollinearity. Although it is reasonable to anticipate that merger patterns would be affected by a wide range of factors, the existence of considerable correlation between some variables made proper interpretation difficult in some cases. Moreover, the motivation aspect in the process of M&A decision-making has not been addressed. To some extent, this might make it difficult to accurately capture the impact of decision-makers' motives. The most obvious example in this study is that it is virtually impossible to distinguish the strategy model from prior impact model. In other words, it is difficult to pinpoint whether the diversification patterns of the cable and telephone industries were a result of managers' rational decision or mimic behavior.

This study only focused on the merger/acquisition strategies of cable systems and telephone companies. There are several lines for further research. First, there is possibility that other types of business partnership such as joint venture and non-equity strategic alliance may exhibit different patterns. One major reason is that joint venture or non-equity strategic alliance is less risky and can be quickly terminated. Thus, companies pursuing joint venture or strategic alliance may be more willing to pursue unrelated combination.

Another line of further research is the role played by the broadcasting industry in this merger wave. Despite the fact that telephone and cable companies are currently the most major players in the high-speed service market, the emergence of digital radio and digital television (or HDTV) also give broadcasters some potential in the multimedia industry. It is interesting to examine what strategies broadcasters would pursue to create competitive advantages in the context of technological convergence.

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